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FLIGHT TEST REPORT GUIDE

Introduction and Instructions

Special Appendix to CAM 3 has been prepared as a guide to aid the applicant in making complete type certification flight test and in preparing a flight test report. The report format is very similar to that used for years by FAA flight test inspectors when conducting official type inspection flight tests and in preparing their reports. The report guide can also be used to assure that the minimum required critical flight characteristics, performance, and pilot operation aspects are considered during a type certification program.

To assist in locating easily and in referring to applicable requirements, there is included a CAR/CAM cross-reference index. In addition, opposite each item in the margin of the report guide is shown the applicable reference CAR/CAM 3 section together with any subsequent amendment number (in parenthesis). The report is arranged in logical sequence of item investigation for the collection of flight data.

The report may be duplicated by an applicant. Only those portions and questions applicable to the model involved or to the alteration of a certificated model, need be included in the final report. Care should be taken that basic information is supplied in each instance and that any inapplicable items and questions are struck out. Whenever it is necessary or desirable to include extra information for a particular item, a notation should be entered "See remarks" or "See attachment _____."

Note that an underlined answer (yes or no) to a question means that the model does not comply with the reference applicable requirement. In preparing a report, be sure to either circle the right answer or strike out the wrong answer(s). If the model has features adding equivalent airworthiness to the requirement, this should be explained under "REMARKS" per paragraph 3 above.

The report guide has been revised to include amendment 3-7 to the Civil Air Regulations. Comments and proposals from industry and FAA regions have also been incorporated wherever applicable. Page numbers have been added to the CAR/CAM cross-reference to facilitate the use of the guide. The amendment numbers that were found in the margins of the previous report guide have been deleted in this revision.

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FEDERAL AVIATION AGENCY

Certification Data Summary

Date _____

Make _____ Model _____

Applicant _____

Specification or Data Sheet No. & Date _____

TC if New Model _____ STC if Alteration _____

If Alteration, state nature, reason, and by whom made _____

Type Inspection Authorization No. & Date _____

Other Authorization _____

Certification Basis _____

Serial No. Tested _____ Serial Nos. Eligible _____

Certification Data Forwarded to Washington _____

Certification Data Available in Responsible Region _____

Responsible Region _____ Approved By _____

SECTION O. ADMINISTRATIVE INFORMATION

A. Administrative Data:

1. Airplane(s) Tested: Model No. _____
Serial No. _____ Registration No. _____

2. When were flight tests conducted? _____ To _____

3. Where were flight tests conducted? _____

4. Has applicant:

3.65 a. Submitted a Report on Calibration of Instruments and correction
of test results to standard atmospheric conditions..... Yes No

3.16 b. Submitted a report of his flight tests (Attach report)..... Yes No

3.62 c. Provided a pilot with a valid and appropriate pilot certificate
to make the flight tests? (State which certificate _____) Yes No

3.64 d. Provided satisfactory emergency egress on the test airplane,
such as door rip hinges, for use of the crew wearing parachutes? Yes No

3.63 5. Was the applicant's test pilot unable or unwilling to conduct any
of the required official flight tests or, were items of non-
compliance found which might render additional test data meaning-
less or which were of a nature to make further testing unduly
hazardous?..... No Yes

If yes, were official flight tests discontinued and a formal
notice of discontinuance issued? (Attach copy).....NA Yes No

6. If a partial type test, do attachments (page) describe nature
of alteration?..... Yes No

If no, describe below:

SECTION O. ADMINISTRATIVE INFORMATION:

A. Administrative Data: (continued)

7. Were changes made to the airplane during type test? (If "yes", give details)..... Yes No

- 3.10 8. Are all CAR/CAM provisions met?..... Yes No

If "no" were they compensated for by factors which provide an equivalent level of safety?..... Yes No

(Describe all such compensating factors under remarks)

- 3.10 9. Were any regulatory or policy difficulties encountered during the type tests?..... Yes No

(If "yes", briefly state their nature under remarks and reference the separate communication which transmitted these difficulties with a recommended solution.)

- 3.750 10. Type(s) of operation:

a. Is the intended type(s) of operation to be:

(1) Transportation (Air Taxi, Business, Personal)?..... Yes No

(2) Work operations (Aerial Application, Surveying Patrol, Prospecting, Mapping, Conservation) other (Specify)?..... Yes No

(3) Day operations?..... Yes No

(4) Night operations?..... Yes No

(5) IFR operations?..... Yes No

- b. Was any feature or characteristic of the airplane found which renders it unsafe for the category in which it is to be certificated and for the type of operation intended? No Yes

SECTION O. ADMINISTRATIVE INFORMATION:

A. Administrative Data: (continued)

- 3.750 11. Are all of the required equipment items provided for the
3.651 intended type of operation and are they installed satis-
3.655 factorily?..... Yes No

(List below all the equipment items installed, tested and found to comply, that were in excess of the minimum (day-VFR) requirements.)

- 3.11(a) 12. State below the date of the amended CAR 3 and the amendments,
3.12 if any, which are applicable:

CAR 3 amended to _____

Amendments: No _____ Date _____

_____ Date _____

_____ Date _____

- 3.16(b) 13. If airplane type is over 6,000 pounds, has the TCB decided
3.16-1 upon the program, as required, for additional service
tests?..... NA Yes No

(A copy of this accelerated service test report is to be forwarded to each TIR holder)

14. Has a copy of SECTION O. and SECTION I. of this report form been forwarded to all regions and Washington?..... Yes No

SECTION O. ADMINISTRATIVE INFORMATION

A. Administrative Data: (continued)

15. Flight Test Log:

[illegible]

Total Flight Test Time _____

SECTION O. ADMINISTRATIVE INFORMATION:

A. Administrative Data: (continued)

16. List results of special tests specified in the Type Inspection Authorization.

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SECTION 0. ADMINISTRATIVE INFORMATION

B. Reference Data:

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SECTION I. CERTIFICATION INFORMATION:

A. Type of Operation Limitations:

3.20 1. Category: (check appropriate space(s))

Normal () Landplane ()
Utility () Seaplane ()
Acrobatic ()

47.21 2. Equipment: Items installed and found satisfactory for:
49.30 (check appropriate space(s))
3.750

General Operations (CAR 43)

Air Taxi Operations (CAR 47)

VFR (Day) ()	VFR (Day) ()
VFR (Night) ()	VFR (Night) ()
IFR ()	IFR (Day) ()
WEATHER ()	IFR (Night) ()

3.74 B. Maximum Certificated Weights:

Category

Takeoff

Landing

Normal	_____ lbs.	_____ lbs.
Utility	_____ lbs.	_____ lbs.
Acrobatic	_____ lbs.	_____ lbs.

3.71 C. C.G. Limits: (To be completed by the owner)

SECTION I. CERTIFICATION INFORMATION: (continued)

D. Operating Limitations and Information:

1. Airspeeds: (M.P.H.)

3.739 (a) Never Exceed Speed (V_{ne})..... CAS
3.740 (b) Maximum Structural Cruising Speed (V_{nc}):..... CAS
3.741 (c) Maximum Rough Air or Maneuvering Speed (V_p):..... CAS
3.771(c)
3.742(a) (d) Maximum Speed, Flaps Extended (V_{fe}):..... CAS
3.742(b) (e) Maximum Speed, Intermediate Flaps, Flaps Extended: °. CAS
3.771(a) (f) Maximum Speed, Landing Gear Extended:..... CAS
3.778(a) (g) Maximum Speed for Lowering of Landing Gear:..... CAS
3.743 (h) Minimum Controllability Speed (Multiengine V_{mc}):..... CAS
3.111
3.771(b) (i) Demonstrated Crosswind Speed:..... CAS
* (j) Recommended Climb Speed:..... CAS
* (k) Best Angle-of-Climb Speed:..... CAS
* (l) Engine-Inoperative-Climb Speed:..... CAS
* (m) Approach Speed(s):..... CAS

* Airplanes weighing more than 6000 pounds.

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

A. Pilot and Passenger Compartment:

1. Controls: (continued)

- 3.338 e. Are flap controls:
- 3.338-1
- 3.339 (1) Such that the flap(s) will not move from any position required for performance compliance unless further adjusted or by an automatic load limiting device?..... Yes No
- (2) Provided with an indicator or other means to indicate the flap extended, retracted, and any other position required for performance compliance?..... Yes No
- (3) Such that the rate of movement in response to the pilot's control, or automatic device, results in unsatisfactory flight or performance characteristics? No Yes
- (4) Such that flaps are mechanically interconnected?..... Yes No
- (a) If "no", has airplane safe flight characteristics with flaps retracted on one side and extended on other?..... Yes No
- 3.384(c) (5) Located centrally or to the right of the pedestal centerline or of the powerplant throttle control centerline and sufficiently displaced from the landing gear control to avoid confusion?..... Yes No
- 3.341 f. Is a control surface lock system installed?..... Yes No
- If "yes", answer the following:
- (1) When in "locked" position, does it provide an unmistakable warning to the pilot?..... Yes No
- (2) Are means provided to preclude possibility of the lock becoming engaged in flight?..... Yes No

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

A. Pilot and Passenger Compartment:

1. Controls: (continued)

g. Powerplant Controls:

3.384(b)	(1) In multiengine airplanes, are identical controls for the several engines so located as to prevent any misleading impression as to the pertinent engine?.... NA	Yes	<u>No</u>
3.627	(2) Will controls maintain any set position without further attention and without creeping due to control loads or vibration?.....	Yes	<u>No</u>
3.627	(3) Have controls adequate strength and rigidity under operating loads?.....	Yes	<u>No</u>
3.628	(4) <u>Throttle Controls:</u>		
	(a) Does each throttle afford a positive and immediately responsive means of controlling the engine?.....	Yes	<u>No</u>
	(b) Are controls so grouped to permit separate and also simultaneous control of all engines?.. NA	Yes	<u>No</u>
	(c) Does a forward motion open the throttle?.....	Yes	<u>No</u>
3.629	(5) <u>Ignition Switches:</u>		
	(a) Can all ignition switches on multiengine airplanes be quickly shut off?..... NA	Yes	<u>No</u>
	(b) If a master control is provided, are means provided to prevent inadvertent operation?.... NA	Yes	<u>No</u>
3.630	(6) <u>Mixture Controls:</u>		
	Is separate and also simultaneous control of all engines considered satisfactory?.....	Yes	<u>No</u>
3.631	(7) <u>Propeller Speed and Pitch Controls:</u>		
	(a) Are controls grouped to permit control of all propellers both separately and together?.....	Yes	<u>No</u>
	(b) Do controls permit ready synchronization of all propellers?..... NA	Yes	<u>No</u>

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

A. Pilot and Passenger Compartment:

2. Crew Accommodations: (continued)

3.386 c. Crashworthiness provisions:

(1) Does it appear that all occupants, making proper use of belts or harnesses will, with reasonable probability, escape serious injury from penetrating or relatively solid objects (structural features which can be lethal in a crash), including a wheels-up landing, in the event of a minor crash?..... Yes No

3.386(c) (2) For airplanes, other than in which the possibility of a turnover is remote, is there reasonable protection of the occupants in a complete turnover?..... NA Yes No

3.387(d) d. Exits:

Are exits provided for A Category that will permit all occupants with parachutes to bail out quickly at normal flight speeds?..... NA Yes No

3.390(a) e. Seats:

(1) If crew seats are adjustable, are adjustments easily made, intermediate positions secure, not subject to displacement during takeoff and landing operations, and operate satisfactorily?..... NA Yes No

3.390(b) (2) Are all seats in the A Category capable of accommodating passengers wearing parachutes unless placarded otherwise? Yes No

3.755(a) f. Operational Placards and Markings:

(1) Are the following operational placards displayed in a conspicuous place, clear, and not subject to misinterpretation:

3.755(b) (a) Category placard which states the basis of all
3.755-1 markings and placards with reference, if required,
3.770 to AFM information on other categories, and includes the following statement?..... Yes No

"This airplane must be operated as a _____
or _____ category airplane in compliance
with the operating limitations stated in the form of
placards, markings, and manuals".

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

A. Pilot and Passenger Compartment:

2. Crew Accommodations:

f. Operational Placards and Markings:

(1) Are the following operational placards....(continued)

3.769 (b) Prohibited or approved flight maneuvers placard?..... Yes No

3.755-2(b) (c) Flaps operational settings placard, if dangerous characteristics result from an improper setting?.. NA Yes No

3.124(c)(4) (d) Spin recovery procedure placard?..... NA Yes No

(For acrobatic category, and utility category when demonstrated to meet acrobatic category requirements)

3.771 (e) Airspeed Placards

_____ Maximum speed with landing gear extended?.... Yes No

_____ Minimum control speed?..... Yes No

_____ Design maneuvering speed?..... Yes No

_____ Demonstrated crosswind velocity?..... Yes No

3.771(b) _____ Recommended climb speed?..... NA Yes No

_____ Best angle-of-climb speed?..... NA Yes No

_____ Engine-inoperative-climb speed?..... NA Yes No

_____ Approach speeds?..... NA Yes No

3.766

3.755-1(a)(6) (f) Weight and Loading Placards (baggage, cargo, seats, cabin, removable ballast, Normal Category Operations vs Utility Category)..... NA Yes No

3.768 (g) Emergency Exit Placards (placard and controls to be colored red, placard to be adjacent to control and to clearly indicate it as an emergency exit and its method of operation)?..... NA Yes No

3.755(a) (h) Additional Placards (having a direct bearing on safe operation and required by the type's unusual design, operating, or handling characteristics)..... NA Yes No
If additional placards are required, list below:

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

A. Pilot and Passenger Compartment:

2. Crew Accommodations:

f. Operational Placards and Markings: (continued)

3.756 (2) Are the following instrument markings clear and easily visible to the pilot?

3.757(a) (a) Airspeed indicator

3.757-1

V_{he}	- Red radial line.....	Yes	<u>No</u>
Caution Range	- Yellow arc (from V_{he} to V_{no}).....	Yes	<u>No</u>
Normal Range	- Green arc (from V_{no} to V_{sl}).....	Yes	<u>No</u>
Flap Range	- White arc (from V_f to V_{so}).....	Yes	<u>No</u>

3.757(b) (b) Variable V_{he} and V_{no} speed limitations, if applicable.. NA Yes No

3.759 (c) Powerplant Instruments

3.759-1

Maximum safe limit	- Red radial line.....	Yes	<u>No</u>
Minimum safe limit	- Red radial line.....	Yes	<u>No</u>
Normal operating range	- Green arc.....	Yes	<u>No</u>
Takeoff range	- Yellow arc.....	Yes	<u>No</u>
Precautionary range	- Yellow arc.....	Yes	<u>No</u>
RPM range(s), if any, to be avoided	- Red arc.....	NA	Yes <u>No</u>

3.755(a) (d) Additional Instrument Markings..... NA Yes No

(Having a direct bearing on safe operation and required by the type's unusual design, operating, or handling characteristics.)

If additional markings are required, list below:

3.765(b) (3) Accessory and Auxiliary Controls

Are all emergency controls colored red and clearly marked as to their method of operation?..... NA Yes No

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

A. Pilot and Passenger Compartment:

2. Crew Accommodations: (continued)

g. Operating Limitations and Information for Crew

3.777

(1) Airplane Flight Manual

An AFM is required for airplanes with maximum certificated weight over 6000 lbs.

Is maximum certificated airplane weight over 6000 lbs.?

(_____lbs.)

Yes No

If "yes", answer the following:

(a) Is an Airplane Flight Manual provided?..... Yes No

(b) Does it contain only required material, or, is there a distinct separate section confined to the required material?..... NA Yes No

(c) Is the FAA approved portion so marked and identified that no one can easily err in distinguishing approved from unapproved information?..... NA Yes No

(d) If more than one page, is a cover provided with the title "Airplane Flight Manual"?..... NA Yes No

(e) Does each page bear the notation "FAA approved" and date of issuance?..... NA Yes No

(f) Is the material bound in a semi-permanent manner so that pages will not be easily lost, but so that revised pages can be inserted?..... NA Yes No

(g) If airplane has tentative approval only, does the following statement appear on the inside of the front covering page?..... NA Yes No

"The certificate of airworthiness issued to the aircraft described hereon, subject to the final issuance of a covering type certificate, is based upon tentative approval of aircraft of this model. Upon issuance of a covering type certificate it may become necessary to make certain modifications or adjustments to the subject aircraft in order that the certificate of airworthiness may remain effective."

3.72	- Removable ballast amount(s), location, and any cautionary information, such as adverse effects on spins?.....	Yes	NA	No
3.76	- Satisfactory loading combinations? NA	Yes	NA	No
3.778(d)	- <u>Load Distribution</u> - C.G. limits?.....	Yes		No
	- Useful load composition, including weight of fuel and oil with full tanks?.....	Yes		No
	- Useful load?.....	Yes		No
	- Weight Empty (including a list of items of equipment installed and their locations) and its C.G. location?.....	Yes		No
3.778(c)	- <u>Weight</u> - Maximum certification weight?.....	Yes		No
3.73	- Correct powerplant instrument markings?.....	Yes		No
3.778(b)	- <u>Powerplant</u> - An outline and explanation of all powerplant limitations?.....	Yes		No
	- Significance of limitations and of color?.....	Yes		No
	- <u>Maximum safe speed to tower rear?.....</u>	Yes		No

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

A. Pilot and Passenger Compartment:

2. Crew Accommodations: (continued)

g. Operating Limitations and Information for Crew

3.777 (1) Airplane Flight Manual

An AFM is required for airplanes with maximum certificated weight over 6000 lbs.

Is maximum certificated airplane weight over 6000 lbs.? () lbs.)

Yes No

If "yes", answer the following:

(a) Is an Airplane Flight Manual provided?..... Yes No

(b) Does it contain only required material, or, is there a distinct separate section confined to the required material?..... NA Yes No

(c) Is the FAA approved portion so marked and identified that no one can easily be in distinguishing approved

Are all emergency controls colored red and clearly marked as to their method of operation?..... NA Yes No

3.765(b) (3) Accessory and Auxiliary Controls

If additional markings are required, list below:

(Having a direct bearing on safe operation and required by the type's unusual design, operating, or handling characteristics.)

3.755(a)	(d) Additional Instrument Markings.....	NA	Yes	No
	RPM range(s), if any, to be avoided - Red arc.....	NA	Yes	No
	Precautionary range - Yellow arc.....		Yes	No
	Takeoff range - Yellow arc.....		Yes	No
	Normal operating range - Green arc.....		Yes	No
	Minimum safe limit - Red radial line.....		Yes	No
	Maximum safe limit - Red radial line.....		Yes	No
3.759-1	(c) Powerplant Instruments			
3.759				

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

A. Pilot and Passenger Compartment:

2. Crew Accommodations:

g. Operating Limitations and Information for Crew:

(2) Required information: Is the following information provided?

(a) Operating Limitations: (continued)

3.778(e)	<u>Maneuvers</u> - All authorized maneuvers (with appropriate entry speeds) by category?.....	NA	Yes	No
	- All unauthorized maneuvers?.....	NA	Yes	No
	- Statement re "characteristically incapable of spinning"?.....	NA	Yes	No
3.778(f)	<u>Flight Load Factor</u> - Positive limit load factors in terms of acceleration which structure can stand?.....		Yes	No
3.778(g)	<u>Flight Crew</u> - Minimum number and functions of each, if more than one person required to operate plane safely?.....	NA	Yes	No

3.778(h) Times of Operation - Day or night VFR, IFR, and

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

A. Pilot and Passenger Compartment:

2. Crew Accommodations:

g. Operating Limitations and Information for Crew:

(2) Required information: Is the following information provided?

(b) Operating Procedures: (continued)

EMERGENCY PROCEDURES (Preferably located in a separate section or on red colored pages for quick reference)

- Recommended procedures for coping with different types of emergency or critical situations, such as:

- | | | | |
|---|----|-----|-----------|
| (1) A go-around with an engine out..... | NA | Yes | <u>No</u> |
| (2) A landing gear malfunction..... | NA | Yes | <u>No</u> |
| (3) Engine malfunction (on a multiengine airplane) | NA | Yes | <u>No</u> |
| (4) Carburetor icing..... | NA | Yes | <u>No</u> |
| (5) Impact/external icing..... | NA | Yes | <u>No</u> |
| (6) Turbulent air (IFR/VFR) speed and control configuration..... | | Yes | <u>No</u> |
| (7) Obstacle clearance speed and configuration (from short fields and during precautionary landings). | | Yes | <u>No</u> |
| (8) Fire..... | NA | Yes | <u>No</u> |
| (9) Electrical failures (including impact on navigational devices)..... | NA | Yes | <u>No</u> |
| (10) Hydraulic failures..... | NA | Yes | <u>No</u> |
| *(11) Other pertinent information peculiar to the airplane's operating characteristics and necessary to safe operation..... | NA | Yes | <u>No</u> |

* Includes such items as unusable fuel quantity; effects of various configurations on flight characteristics, performance, and handling (gear and flaps down, propeller not feathered and windmilling; cowl flaps open; stall warning variations; effect on an electrical stall warning indicator when master switch is turned off, etc.)

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

A. Pilot and Passenger Compartment:

2. Crew Accommodations:

g. Operating Limitations and Information for Crew:

(2) Required information: Is the following information provided? (continued)

3.780

(c) Performance Information

3.755-2(a)

(1) Stalling speed at maximum weight, gear/flaps down,
M.C. power..... NA Yes No

(2) Stalling speed at maximum weight, gear/flaps up,
M.C. power..... NA Yes No

3.120(e)

(3) Loss of altitude and pitch below level flight
during stall recovery..... NA Yes No

(4) Climb at M.C. power in takeoff configuration... NA Yes No

(5) Climb at M.C. power (all engines) climb configu-
ration..... Yes No

(6) Climb at takeoff power in landing configuration
(for go-around)..... NA Yes No

(7) Climb - engine out - enroute configuration... NA Yes No

(8) Climb/sink - engine out - landing/approach configu-
ration..... NA Yes No

(9) Landing distance and speed from 50 feet..... Yes No

3.122

3.780(b)

(10) Variation of stalling speed with angle of bank up
to 60° (maximum weight, gear/flaps up)..... Yes No

(11) Items required for airplanes with a maximum
certificated weight over 6000 lbs.

(a) Takeoff distance and speed to clear 50 feet Yes No

3.780-2

3.780-3

(b) Variation (calculated) of takeoff distance,
landing distance and rates of climb from effects
of altitude and temperature..... Yes No

3.780(d)

(12) The best climb/minimum descent speed for multiengine
airplanes with one engine inoperative?..... NA Yes No

[illegible]

B. Fire Protection:

a. Is a built-in fire extinguishing system installed?..... Yes No

8.335

- b. Is a fire detection system installed?..... Yes No

[illegible]

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

C. Powerplant

1. Engine:

a. Engine Name and Model _____
T. C. No. _____

b. Carburetor Name and Model _____

c. Engine Gear Ratio _____

d. Operation:

3.15(a) (1) Is the engine(s) new or in such condition that it
apparently is developing its power rating(s)?..... Yes No

3.411(b) (2) Are vibration characteristics of engine installation
apparently normal at all operating speeds on the ground
and in flight?..... Yes No

If "no", indicate rough spots _____ to
_____ R.P.M. to be avoided.

3.662 (3) Does the engine(s) shake instruments excessively, such as
to cause the accuracy of the instruments to be inadequate,
or to cause damage to them?..... No Yes

3.429 (4) Does the engine(s) accelerate promptly upon quickly
opening throttle after glide for landing?..... Yes No

3.429 (5) Is there any uneven engine operation during takeoff which
might indicate that fuel system will not feed properly in
bumpy takeoff?..... No Yes

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

C. Powerplant:

1. Engine:

d. Operation: (continued)

(6) Do the following items show signs of excessive vibration and/or distortion from engine movement, air loads, or accelerated flight conditions?

.625	(a) Cowling.....	No	<u>Yes</u>
.550	(b) Fuel Lines.....	No	<u>Yes</u>
.570	(c) Oil Lines.....	No	<u>Yes</u>
.671	(d) Instrument Lines.....	No	<u>Yes</u>
.616	(e) Manifolds.....	No	<u>Yes</u>
.627	(f) Powerplant Controls.....	No	<u>Yes</u>
	(g) _____	No	<u>Yes</u>
	(h) _____	No	<u>Yes</u>

.429

(7) Engine idling speed on ground _____ R.P.M.:

Is idling speed such that engine will continue to function during all maneuvers encountered in official flight tests?.....

Yes No

.627

(8) Any undesirable characteristics noted in engine control operation, or arrangement?.....

No Yes

2. Propeller:

a. Blades:

(1) Make and Model _____

(2) T. C. No. _____

(3) Number of Blades _____ (4) Diameter _____

(5) Material _____ (6) Activity Factor _____

(7) Thickness ratio at 3/4 radius _____

(If "no", indicate rough spots _____ R.P.M. to be avoided) _____ to _____

3.417

(1) Does operation of the propeller(s) appear smooth at all operating speeds on ground and in flight? Yes No

f. Operation:

e. Propeller Detaching Model

d. Propeller Governor Model

(e) Auto. Varying

(d) Reversible

(c) Feathering

(b) Constant Speed

(a) Two Position

Degrees

Inches

Station Reversed Reversed Reversed Reversed Reversed Reversed

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

C. Powerplant:

1. Engine:

d. Operation: (continued)

(5) Do the following items show signs of excessive vibration and/or distortion from engine movement, air loads, or accelerated flight conditions?

3.625	(a) Cowling.....	No	<u>Yes</u>
3.550	(b) Fuel Lines.....	No	<u>Yes</u>
3.570	(c) Oil Lines.....	No	<u>Yes</u>
3.671	(d) Instrument Lines.....	No	<u>Yes</u>
3.616	(e) Manifolds.....	No	<u>Yes</u>
3.627	(f) Powerplant Controls.....	No	<u>Yes</u>
	(g) _____	No	<u>Yes</u>
	(h) _____	No	<u>Yes</u>

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

C. Powerplant:
2. Propeller:

f. Operation: (continued)

(2) If fixed pitch, ground adjustable, or automatically varying:
VN

(a) Is it desired that prop permit T.O. r.p.m. at best angle of climb speed in balked landing configuration?.....

Yes No

If "yes" are engine cooling requirements set at this speed?.....

Yes No

If "no", is the propeller pitch such that the engine maximum permissible T.O. r.p.m. is not exceeded at T.O. power during takeoff and initial climb at best rate of climb speed?.....

Yes No

R.P.M. I.A.S. M.P.H. (C.A.S. M.P.H.)

apparently normal at all operating speeds on the ground and in flight?.....

Yes No

If "no", indicate rough spots _____ to _____ R.P.M. to be avoided.

- | | | | |
|-------|---|-----|------------|
| 3.662 | (3) Does the engine(s) shake instruments excessively, such as to cause the accuracy of the instruments to be inadequate, or to cause damage to them?..... | No | <u>Yes</u> |
| 3.429 | (4) Does the engine(s) accelerate promptly upon quickly opening throttle after glide for landing?..... | Yes | <u>No</u> |
| 3.429 | (5) Is there any uneven engine operation during takeoff which might indicate that fuel system will not feed properly in bumpy takeoff?..... | No | <u>Yes</u> |

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

C. Powerplant:

2. Propeller:

f. Operations:

(4) If constant speed: (continued)

3.419-1(b) (c) Is the airplane to be operated with and without
ADI (anti-detonation injection)?..... Yes No

If "yes", were the above tests made at the lower
pitch setting of the wet and dry ratings?..... Yes No

(5) If feathering: NA

3.577 (a) Is feathering dependent on engine oil supply?... Yes No

3.637(b)

If "yes", in event of failure of any portion of
the lubrication system other than the tank it-
self, may feathering be satisfactorily
accomplished?..... NA Yes No

(b) At takeoff climb speed, what is time required
to:

1. Feather from windmilling at _____
RPM; _____seconds

2. Unfeather until propeller reaches 1000 RPM;
_____seconds

3.416(c) (c) Can each propeller be unfeathered individually
(3-5) in flight?..... Yes No

(6) If reversible: NA

3.631 (a) Are these controls so grouped to permit control
of the propellers separately and/or together?.. Yes No

3.627 (b) Are these controls provided with means to
prevent inadvertent operation?..... Yes No

(c) At landing, what is time required to reverse
the propeller from idling in low pitch to M.C.
R.P.M. in negative thrust _____seconds?..

(d) Does putting throttle back increase deceleration
thrust?..... Yes No

(If "no", explain procedure used):

REMARKS

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SECTION II. EQUIPMENT AND FLIGHT OPERATION:

C. Powerplant:

2. Propeller:

f. Operations: (continued)

(7) Deicing system:

3.411(b)

Is deicing provided for each propeller?.....NA Yes No

If yes, State type_____

(If fluid, conduct the following test; at cruising speed, and starting with a full tank of deicing fluid, put on maximum flow to all propellers for a 15 minute timed period, and answer the following:

(a) Is distribution to each propeller and operation in flight satisfactory?..... Yes No

(b) What is amount of fluid used? _____gallons per engine.

3.637(a)

(c) Can hazardous quantities of any flammable deicer fluid flow to the engine compartment? NA Yes No

3.637(d)

(d) Are provisions made to guard against inadvertent operation of the shutoff means?... NA Yes No

3.637(d)

(e) Is it possible for crew to reopen the shutoff means after it has been closed?..... NA Yes No

3. Fuel System:

a. Arrangement:

3.430

(1) Is it possible for any one fuel pump to draw fuel from more than one tank at the same time?..... NA No Yes

3.430

(2) In gravity feed system, can any engine be supplied with fuel from more than one tank at a time in such a way that tanks feed unequally?..... NA No Yes

3.439

(3) When tank outlets are interconnected, is it possible for fuel to flow between tanks in quantities sufficient to cause an overflow of fuel from the tank vent when the tanks are full and the airplane is operated in various critical attitudes?.... NA No Yes

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

C. Powerplant:

3. Fuel System:

a. Arrangement: (continued)

3.633

(4) Fuel Shutoff Valves

3.551(a)

(a) Are means provided to permit the flight personnel to shutoff rapidly the flow of fuel to any engine individually in flight?..... Yes No

3.551(b)

(b) Can the flight personnel reopen the valves rapidly in flight after they have been closed? Yes No

3.637(d)

3.551(b)

(c) Are fuel shutoff valves guarded against inadvertent operation?..... Yes No

3.637(a)

(d) Does closing the fuel shutoff valve for any engine make any of the fuel supply unavailable to the remaining engines?..... NA No Yes

b. Fuel Tank Details:

3.446

(1) During normal operation, is there any noticeable syphoning or spilling of fuel?..... No Yes

3.446

(2) Are vents terminated at points where the discharge of fuel from the outlet will cause fumes to enter personnel compartments?..... No Yes

3.447-A

(3) In acrobatic type airplanes, is there excessive loss of fuel during acrobatic maneuvers-including short periods of inverted flight, or any syphoning from a vent when normal flight has been resumed?..... NA No Yes

c. Fuel Quantity Indicators:

3.672

3.672-1

(1) Are suitable means provided to indicate to the flight personnel the quantity of fuel in gallons or pounds in each tank during flight?..... Yes No

(2) Are exposed sight gages so installed and guarded as to preclude the possibility of breakage and damage?..... NA Yes No

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

C. Powerplant:

3. Fuel System:

c. Fuel Quantity Indicators: (continued)

- 3.672 (3) Are there any small auxiliary tanks that do not have quantity indicators?..... Yes No
- If "yes", does the relative size of the tanks, rate of fuel transfer, and operating instructions guard against overflow and assure that the crew will receive prompt warning if fuel transfer is not being achieved as intended?..... Yes No
- 3.673 (4) When a fuel flowmeter indicator is installed, does the bypass operate satisfactorily in the event of malfunctioning?..... NA Yes No

d. Emergency Fuel Pump and Installation:

- 3.449 (1) Are emergency pumps easily available for immediate use?..... NA Yes No
- 3.435 (2) Is excessive effort required in hand-emergency pumps for continued operation at the rate of 60 complete cycles (120 single strokes) per minute? NA No Yes
- 3.449(b) (3) Does the emergency and normal pump operate continuously?..... Yes No
- If "yes", are means provided to indicate to the crew when either pump is malfunctioning?..... Yes No

4. Lubrication System:

- 3.568(b)-A a. Is there hazardous loss of oil during acrobatic maneuvers, including short periods of inverted flight?..... NA No Yes
- 3.575(b)-A
- 3.637 b. Oil Shutoff Means
- (1) Are means provided to permit the flight personnel to shutoff the flow of oil to any engine individually in flight?..... NA Yes No
- (2) Can the flight personnel reopen the valves in flight after they have been closed?..... NA Yes No
- (3) Are these oil shutoff means reasonably protected from inadvertent operation?..... NA Yes No

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

C. Powerplant: (continued)

5. Cooling System: (For air or liquid cooled engines)

- .627 a. Are all cowling flaps and shutters, and their actuating mechanism sufficiently rigid and positively operable?.... Yes No
- .627 b. Do cowling flap and shutter controls maintain any necessary position without constant attention by flight personnel and not tend to creep due to control loads and/or vibration?..... Yes No

6. Induction System:

- .605(b) a. Using the alternate air intake system, is there any excessive loss of power above the power lost due to the increase in temperature of the air?..... NA No Yes
- .607 b. Is induction air preheater provided?..... Yes No
- (1) If a preheater is used in combination with fluid deicing system, is flow available to all engines simultaneously?..... NA Yes No
- (2) Is the cockpit control sufficiently strong and so arranged that it will not "spring" or otherwise fail to function in the event of ice formation when in the "cold" position?..... Yes No
- (3) Does the induction air heat control maintain any necessary position without constant attention by the flight personnel and not tend to creep due to control loads and/or vibration?..... Yes No

7. Exhaust System:

- .615(b) a. Are exhaust gases discharged at such a location that they will not cause a glare to seriously affect pilot visibility at night?..... Yes No
-
-
-
-

SECTION II. EQUIPMENT AND FLIGHT OPERATION: (continued)

D. Electrical System:

1. Fuses, Circuit Breakers and Switches.....Installed?... Yes No
- 3.691 a. Are protective devices in circuits essential to safety in flight so located and identified that fuses may be replaced or circuit breakers reset readily in flight?..... Yes No
- 3.695 b. Are switches so installed as to be readily accessible to the appropriate crew members?..... Yes No
- 3.695 c. Are switches adequately labeled as to operation and circuit controlled?..... Yes No
2. Lights:
- a. Instrument Lights.....Installed?... Yes No
- 3.697 (1) Are instrument lights installed in such a manner that direct rays are shielded from the pilot's eyes?..... Yes No
- 3.697 (2) Are direct rays reflected from the windshield or other surface into the pilot's eyes?..... No Yes
- 3.696 (3) Is sufficient illumination provided so that all instruments, switches, placards, etc., are easily readable and discernible?..... Yes No
- b. Landing Lights.....Installed?... Yes No
- 3.699 (1) Are landing lights installed such that no dangerous glare is visible to the pilot?..... Yes No
- (2) Do they sufficiently light the runway?..... Yes No
- (3) Is the glow, reflection or halation from the landing lights in the pilot's compartment considered objectionable?..... No Yes

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

D. Electrical System:

2. Lights: (continued)

- 3.705 c. Rotating (anticollision) Light System.....Installed?... Yes No
- (1) Is light so located that emitted light is not detrimental to crew's vision or result in adverse effects on control of the airplane?..... Yes No
- (2) Is light so located that it does not detract from the conspicuity of the position lights?..... Yes No
- 3.652 d. All Lights:
- (1) Are all light switches so installed as to be readily accessible to the appropriate crew members?..... Yes No
- 3.652 (2) Are switches adequately labeled as to operation and the light controlled?..... Yes No
- (3) Does the operation of the switches appear adequate for service use?..... Yes No
- 3.652 3. Are there any unsatisfactory features in connection with the
- 3.681 electrical system operation, any hazards in itself, in methods of operation, or in effects on other parts?..... No Yes

REMARKS

SECTION II. EQUIPMENT AND FLIGHT OPERATION: (continued)

E. Equipment and Operational Features:

1. Flight Control Installations:

a. Automatic Pilot System.....Installed?.... Yes No

Make and Model _____

	<u>Servo Unit</u> <u>Model No.</u>	<u>Gear Train</u> <u>Model No.</u>	<u>Capstan</u> <u>Sizes</u>
Rudder	_____	_____	_____
Elevator	_____	_____	_____
Aileron	_____	_____	_____
Trim	_____	_____	_____

3.667(a) (1) Can the automatic pilot system be quickly and positively disengaged by the human pilot(s) to prevent it from interfering with his control of the airplane?..... Yes No

(a) If "no", can the autopilot be sufficiently overpowered by one human pilot to enable him to control the airplane?..... Yes No

(2) Is the system dependent upon pilot "overpowering" to maintain flight control in the event of a malfunction?..... Yes No

If "yes", answer the following:

(a) Does the system have any features subject to malfunction which are located between the overpowering component and the unit's attachment to a flight control?..... Yes No

If "yes", is there a mechanical disconnect device that satisfactorily disengages the complete system from the flight controls?..... Yes No

4b.612-4 (b) Is it possible to overpower servo forces plus resultant airloads in all configurations of flight demonstrated, including maximum speed for which approval is sought, without exceeding the following control forces measured at the pilot's controls; pitch - 50 lbs., roll - 30 lbs., yaw- 150 lbs?..... Yes No

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

E. Equipment and Operational Features:

1. Flight Control Installations:

a. Automatic Pilot System: (continued)

.667(d) (3) Is an emergency disengagement device provided?..... Yes No

If "yes" answer the following:

(a) Is it located on the pilot's (and copilot's)
control wheels to the side away from the
throttles?..... Yes No

(b) Does it operate satisfactorily?..... Yes No

.667(b) (4) Is automatic synchronization provided for each control
system involved?..... Yes No

(a) If "no", are satisfactory means provided to
indicate readily to the pilot the alignment of
the actuating device in relation to the control
system it operates?..... Yes No

.667(c) (5) Are all manually operated controls for the system's
operation readily accessible to the pilot?..... Yes No

Also to the copilot if a copilot is required?... NA Yes No

.335 (6) Is each control clearly marked to indicate its method
of operation?..... Yes No

.667(d) (7) Have positive means been provided to prevent the
engagement of the system before the automatic pilot is
ready for operation, or when any gyroscopic components
are caged or inoperative?..... Yes No

(a) If "no", have positive means been provided to
indicate to the pilot when the automatic pilot
is ready and when any controllable gyroscopic
components are inoperable?..... Yes No

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

E. Equipment and Operational Features:

1. Flight Control Installations:

a. Automatic Pilot System: (continued)

(8) List the servo stall forces used during the tests below:

Stall Force at Servo (in-lbs) at "Capstan" or "Connection to the control system." (State which)

	<u>Minimum</u>	<u>Maximum</u>
Rudder	_____	_____
Aileron	_____	_____
Elevator	_____	_____
Trim	_____	_____

4b.612-4(h)

(If an envelope of forces has been used, the tests to determine the adequacy of the automatic pilot to control the aircraft will be accomplished at the minimum servo stall force settings, and tests to determine that the aircraft will not be endangered from severe loads or dangerous deviations in the flight path will be conducted at the maximum servo stall force settings)

3.667(d)

(9) Flight Tests

With the aircraft loaded at the most critical GW and c.g. for the condition to be tested, can the aircraft be smoothly maneuvered to the fullest extent appropriate to the type of automatic pilot and airplane, including the use of altitude control and coordinated turn control when installed, without inadvertently placing loads beyond an envelope of 0 to + 2 "G" or encountering dangerous deviations from the flight path?.....

Yes No

Conditions at which tests were made: GW _____ lbs.;
C.G. _____ % MAC

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

E. Equipment and Operational Features:

1. Flight Control Installations:

a. Automatic Pilot System:

(9) Flight Tests (continued)

- (a) When an oscillatory condition is induced in the airplane controls through a single malfunction:

Can it produce loads hazardous to the airplane with a minimum delay of 3 seconds after detecting the malfunction and prior to the pilot taking corrective action?..... NA No Yes

When used in conjunction with an instrument landing aid, can it produce dangerous deviation from the flight path or any degree of loss of control within a minimum delay of one second after detecting the malfunction and prior to pilot taking corrective action?

(See following test data.)

Cruising Flight 75% METO Power				ILS Approach 1.4 V _{so}		
Flaps Up _____ Gear Up _____				Approach Flaps _____ °		
Cruising Altitude _____ Ft.				Landing Gear Down _____		
Engines: "HG _____ RPM _____ BHP				Engines: "HG _____ RPM _____ BHP		
Weight _____ . C.G. _____ % MAC				Weight _____ . C.G. _____ % MAC		
Test Data	Aileron	Rudder	Elevator	Aileron	Rudder	Elevator
Period of Resulting Oscillation						
Maximum Angle of Bank, Yaw, or Pitch						
Time Before Corrective Action Is Taken						
Maximum Altitude						
Minimum Altitude						
Maximum Maneuver Acceleration						
Minimum Maneuver Acceleration						

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

E. Equipment and Operational Features:

1. Flight Control Installations:

a. Automatic Pilot System:

(9) Flight Tests (continued)

(b) In any of the tests below, when corrective action is taken with a minimum delay of 3 seconds after the pilot detects the signal or combination of signals of the malfunction, does the simulated failure and/or subsequent corrective action (1) create loads beyond an envelope of 0 to 2G, (2) speeds beyond V_{ne} , or (3) dangerous deviations from the flight path?.....

No Yes

Test #1 Climb - 75% MCP, Flaps & Gear Up.

Test #2 Cruise - 75% MCP, Flaps & Gear Up.

Test #3 Descend - Maximum permissible auto-pilot speed, Flaps & Gear Up. (Attach test data)

Test #4 Multiengine aircraft with critical engine inoperative, propeller in minimum drag position - MCP on operative engine(s), Flaps & Gear Up.

[illegible]

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

E. Equipment and Operational Features:

1. Flight Control Installations:

a. Automatic Pilot System:

(9) Flight Tests (continued)

3.667(d) (c) Does the autopilot system include an approach
(4b.612-4(c)) coupler?..... Yes No

If "yes", in any of the tests below, when
corrective action is taken with a minimum delay
of one second after pilot detects the signal or
combination of signals of the malfunction, does
the simulated failure or subsequent corrective
action produce (1) hazardous flight path, or

(2) any degree of loss of control?..... No Yes

Test #5 ILS Approach at 1.4Vs1, flaps in
approach position, gear down, all
engines operating.

Test #6 ILS Approach with configuration and
speed for and with critical engine
inoperative.

Test #7 ILS Approach at 1.4Vs1, flaps in
approach position gear down and a
simulated critical engine failure
during the approach. (Attach test data)

3.667(d) (d) If no approach coupler is incorporated in the
(4b.612-4(c)) system, will autopilot satisfactorily meet tests
and conditions of Tests #4, 5 and 6 above where
manual control is used?..... NA Yes No

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

E. Equipment and Operational Features:

1. Flight Control Installations:

a. Automatic Pilot System: (continued)

(10) Test Data:

Test # _____ Flight phase being tested: _____
(Climb, cruise, descent, approach)

Configuration: Flap Position _____ Gear Position _____

Power: Engine(s) _____ In. Hg. _____ R.P.M.

Weight: _____ lbs. _____ % MAC

Signal	Trim Speed I.A.S. M.P.H.	Max. or Min. Speed I.A.S. M.P.H.	Initial Altitude Feet	Min. or Max. Alt. Feet	Max. Angle Bank, Pitch or Yaw	Time Before Recovery Initiated	Acceleration		Time to Recover Seconds	Control Force		
							Man.	Rec.		Rud.	Elev.	Ail.
Hard Left Aileron												
Hard Right Aileron												
Hard Left Rudder												
Hard Right Rudder												
Hard Up Elevator												
Hard Down Elevator												
Hard Down Ele. Hard Left Rud. Hard Left Ail.												
Hard Up Ele. Hard Left Rud. Hard Left Ail.												

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

E. Equipment and Operational Features:

1. Flight Control Installations:

a. Automatic Pilot System: (continued)

(11) Test Results

At the critical weight and c.g. for the phase of flight condition tested, answer the following:

- | | | |
|--|--------|------------|
| (a) Can the autopilot satisfactorily control the airplane in all maneuvers appropriate to the type of autopilot installed?..... | Yes | <u>No</u> |
| (b) Does each control satisfactorily perform its intended function?..... | Yes | <u>No</u> |
| (c) When used in conjunction with an ILS aid, can smooth transition be made from cruising or descent through approach to a landing configuration?.. | NA Yes | <u>No</u> |
| (d) When used in conjunction with an ILS aid, does an engine failure cause deviations from the flight path greater than 3°/sec.?..... | NA No | <u>Yes</u> |
| (e) When used in conjunction with an ILS aid, has pilot a visual means of knowing when the autopilot is uncoupled from the ILS aid?..... | NA Yes | <u>No</u> |
| (f) With an ILS aid coupler, is automatic pilot capable of conducting an approach with airplane trimmed for critical engine inoperative flight?..... | NA Yes | <u>No</u> |
| (g) If an automatic trim system is incorporated, can its failure create a hazard to automatic or manual flight?..... | NA No | <u>Yes</u> |
| (h) Is the autopilot system subject to adverse reactions from spurious signals from: | | |
| - Variation in the power source..... | No | <u>Yes</u> |
| - Induced signals from other systems?..... | No | <u>Yes</u> |
| - Feedback signals from other equipment, operating on same autopilot power source?..... | No | <u>Yes</u> |

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

E. Equipment and Operational Features:

1. Flight Control Installations:

a. Automatic Pilot System: (continued)

3.667 (12) Airplane Flight Manual Information
(4b.612-4(b))

Is the following information included in the AFM?... NA Yes No

(a) Operations Limitations Section -

- Autopilot airspeed limitations (specify) _____

- Other operating limitations, if any, such as
"approach localizer at angle of 45° or less"
(specify) _____

(b) Operating Procedures Section

- Normal operating Information (specify) _____

(c) Emergency Operating Procedures Section

- Altitude lost in following flight phase
conditions:

Cruise _____ ft.

ILS Approach _____ ft. (with ILS coupler)

ILS Approach _____ ft. (w/o ILS coupler)

ILS Approach _____ ft. (Engine out w/coupler)

ILS Approach _____ ft. (Engine out w/o coupler)

- Other emergency procedures information (specify)

E. Equipment and Operational Features:

a. Automatic Pilot System: (continued)

(ref. item(6) above)?..... Yes No

(Specify each such one below)

tate method of inducing oscillatory condition: (See Section II E. 1. a. (9))

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

E. Equipment and Operational Features:

1. Flight Control Installations: (continued)

b. Gyroscopic Indicators

Are one or more gyroscopic instruments installed?..... Yes No

If "yes", answer the following:

- 3.668 (1) Is energy for actuating all gyroscopic instruments from a reliable source with capacity sufficient to maintain required accuracy at all speeds above the best rate of climb speed?..... Yes No
- 3.668 (2) Is the installation subject to malfunctioning due to rain, oil, and other detrimental elements?..... No Yes
- 3.668 (3) Is a satisfactory means provided to indicate to the pilot the adequacy of the power being supplied to the instruments?..... Yes No
- 3.668(a) (4) If multiengine airplane, answer the following: NA
- (a) Are two independent sources of energy supplied?... Yes No
- 3.668(a) (b) Is a means provided to indicate the adequacy of the power being supplied by each source?..... Yes No
- 3.668(a) (c) Is a suitable means installed to select either power source for the proper functioning of the instruments should failure of one source occur?.... Yes No
- (Specify whether manual or automatic _____)
- 3.668(b) (d) Are the installation and power systems such that failure of one instrument or of either energy supply will not interfere with the proper supply of energy to the remaining instruments or from the other source?..... Yes No

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

E. Equipment and Operational Features:

1. Flight Control Installations: (continued)

3.661(b) c. Instrument Locations and Arrangements:

- (1) If a multiengine airplane, are identical powerplant instruments so located as to prevent confusion as to the engine to which each relates?..... NA Yes No

3.665 (2) Static Air Vent System

Are the airspeed indicator, altimeter and any other instruments which are provided with static air case connections influenced by airplane speed, the opening and closing of windows, airflow variation, moisture, or other foreign matter which seriously affects their accuracy?..... No Yes

3.666 (3) Magnetic Direction Indicator

Does the deviation in level flight exceed 10° on any heading?..... No Yes

3.669 (4) Flight Director Instrument

Is a flight director (zero reader, etc.) installed?.... No Yes

If "yes" is:

- (a) Its installation and operation free from adverse effects on the performance and accuracy of the required instruments?..... Yes No

- (b) A means provided for disconnecting the flight director instrument from the required instruments or their installations?..... Yes No

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

E. Equipment and Operational Features: (continued)

2. Deicers:

- 3.712 a. Are pneumatic deicers installed?..... Yes No
- (1) If "yes", are positive means provided for the
deflation of all the boots?..... Yes No
- 3.10 (2) Are stall characteristics satisfactory with all
deicers in operation?..... Yes No
- (3) List deicer installations:
-

3. Flares:

- a. Are flares installed?..... Yes No
- 3.714 (1) If "yes", are release controls so installed that the
probability of accidental discharge is reduced to a
minimum?..... Yes No
- 3.714 (2) Are release controls operated easily by pilot or
copilot?..... Yes No
- 3.714 (3) Was a ground test for operation of flares considered
adequate?..... Yes No
- If "no", is the release of flares satisfactory in
flight?..... Yes No
- 3.762 (4) Are flare controls plainly marked as to function and
method of operation?..... Yes No

3.718 4. Emergency Flotation and Signaling Equipment:

a. Signaling device:

Is very pistol or equivalent device easily accessible,
function satisfactorily, and free from hazard in operation? NA Yes No

3.711 b. Rafts and Life Preservers:

3.717

Is each raft and life preserver readily available to the crew
and passengers, and plainly marked as to method of operation? NA Yes No

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

E. Equipment and Operational Features: (continued)

5. Radio Equipment:

Is radio equipment installed?..... Yes No

If "yes":

.721 a. Is radio equipment and installation free from hazards in themselves, in method of operation, and in effects on components?..... Yes No

.652 b. Does the installed radio equipment:

(1) function properly?..... Yes No

(2) adequately perform the functions for which it is to be used?..... Yes No

.652 c. Is the radio equipment adequately labeled as to identification and function?..... Yes No

REMARKS

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

E. Equipment and Operational Features: (continued)

3.725 6. Engine Driven Accessories for Multiengine Airplanes:

- a. Are engine driven accessories essential to the safe operation of the airplane so distributed among two or more engines that the failure of any one engine will not impair the safe operation of the airplane by malfunctioning of these accessories during the type(s) of operations intended?..... NA Yes No

7. Landing Gear:

3.145 a. Nose (or tail) wheel:

Does wheel unit function satisfactorily during ground operations and not require an exceptional degree of pilot skill or alertness (for a private pilot) to maintain directional control?..... Yes No

(Is nose (or tail) wheel steerable?..... Yes No)

(Can nose (or tail) wheel be locked?..... Yes No)

3.356 b. Gear is:.....Retractable Fixed

If gear is retractable, answer following:

- (1) Does the positive means provided for the purpose of maintaining the wheels in the extended position operate satisfactorily?..... Yes No

- 3.356 (2) Can the landing gear, wheel well doors, and retracting mechanism in the extended position withstand the flight loads during retraction at 1.6V_{s1} flaps retracted, or at maximum gear extension speed, whichever is greater?..... Yes No

(Indicate speed of test _____ M.P.H. I.A.S. _____ C.A.S.)

- 3.356 (3) At speed of 1.6V_{s1} (Flaps retracted) or at maximum speed
3.356-1 with gear extended, whichever is greater, is the operation of the landing gear retracting mechanism and the doors satisfactory for the extension and the retraction of the gear, including degree of yawed flight expectable in this configuration?..... Yes No

- 3.359 (4) Does the indicator satisfactorily show the pilot at all
3.765(a) times when the wheels are secured in either extreme position?..... Yes No

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

E. Equipment and Operational Features:

7. Landing Gear:

b. If gear is retractible, (continued)

8.359 (5) For landplane, is an aural or equally effective device
8.359-2 installed which shall function continuously after the
8.359-1(a) throttle is closed until the gear is down and locked?.. Yes No

8.357 (6) Is gear manually operated?..... Yes No

If "no", specify type of means used _____,
and answer the following:

8.357 (a) Is an auxiliary means provided for extending the
landing gear?..... Yes No

8.765(b) (b) Is this control colored red and clearly marked as
to method of operation?..... Yes No

8.358 (c) Is the operation of this auxiliary means
satisfactory?..... Yes No

c. Brakes:

8.335 (1) Is operation of brake control system satisfactory?..... Yes No
8.384

8.363 (2) Are brakes adequate to prevent the airplane from
rolling on a paved runway while applying takeoff power
to the critical engine?..... Yes No

8.363 (3) Are brakes of sufficient capacity to provide adequate
speed control during taxiing without the use of
excessive pedal or hand forces?..... Yes No

8.335 d. Parking Brakes Installed?..... Yes No
8.384

If "yes", answer the following:

(1) Is lock positive and operation satisfactory for ground
starting of engine(s)?..... Yes No

(2) Is arrangement such that inadvertent locking during
flight unlikely?..... Yes No

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

E. Equipment and Operational Features: (continued)

8. Control System Operation:

- a. During any of the flight testing of this airplane, has it been necessary to change the travels of any of the control surfaces or tabs?..... No Yes

If "yes", list the item and the change in travel in degrees:

_____	_____
_____	_____
_____	_____
_____	_____

- 3.328 b. If an adjustable stabilizer is used, do stabilizer stops limit travel to a range permitting safe flight and landing? NA Yes No

- 3.347 c. Are any bungee devices used in any control system?..... No Yes

(1) If "yes", what are the control systems? _____

- (2) Is rubber cord used for this purpose?..... No Yes

- (3) Has the reliability of spring devices or other suitable device been established by tests simulating service conditions?..... Yes No

- (a) If "no", has it been demonstrated that the failure of the spring or device will not cause flutter or unsafe flight characteristics?..... Yes No

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

E. Equipment and Operational Features:

8. Control System Operation: (continued)

B.335 d. Do flight controls have a boost system or systems installed?... No Yes

(1) If "yes", list the system and the type of boost operation:

(2) Has it been demonstrated that the airplane may be flown and landed safely in the event of failure of the boost system?..... Yes No

(a) If "no", is an adequate and reliable emergency boost control system provided which is completely independent of the primary boost system and which has been demonstrated to permit the airplane to be flown and landed safely?..... Yes No

REMARKS

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

E. Equipment and Operational Features: (continued)

9. Fuel Jettisoning System:

3.242 a. Is the maximum takeoff weight greater than 105% of the maximum landing weight?..... No Yes

(If "yes", is provision made for the jettisoning of fuel)? Yes No

b. If a fuel jettisoning system is provided, complete preliminary tests using nonflammable colored fluid consisting of _____

c. Information:

(1) Which tanks use the same chutes? _____

(2) Which tanks are symmetrically disposed about the center-line of the fuselage? _____

(3) Give location of each dump chute _____

d. Test results (with nonflammable fluid)

3.242 (1) Does dumped fluid come in contact with any portion of
(4b.437(b)) airplane?..... No Yes

3.242 (2) Does dumped fluid or fumes enter any portion of the
(4b.437(b)) airplane?..... No Yes

3.242 (3) Is control of airplane adversely affected by dumping
(4b.437(b)) process?..... No Yes

3.242 (4) Does dump valve operating mechanism permit closing
(4b.437(d)) valves?..... Yes No

3.242 (5) Is there any evidence of leakage of valve after closing?. No Yes
(4b.437(d))

3.335 (6) Is mechanism considered adequate?..... Yes No

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

E. Equipment and Operational Features:

9. Fuel Jettisoning System:

d. Test results (with nonflammable fluid) (continued)

- B.384
(4b.475)
- (7) Are fuel jettisoning controls conveniently located to operating personnel, provided with guards to prevent inadvertent operation, and located apart from any fire extinguishing controls?..... Yes No
- B.384
- (8) Are controls identified and clearly marked as to method of operation?..... Yes No

(If answer to any of these questions is underscored, describe fully under "Remarks".)

REMARKS

- e. If preliminary tests are satisfactory, complete following tests using gasoline (Octane rating _____):

SECTION II.E.9.f.

Fuel Jettisoning Flight Test Data: (airplane at maximum T.O. Weight) Fluid used _____ T.O. Weight _____

C.G. _____ Flap Position _____ Landing Gear Position _____ Cowl Flap Position _____

Tank No.	Location of Tank Equipped for Dumping	Tank Capacity Gallons	AT START OF DUMPING						AT END OF DUMPING					
			I.A.S. M.P.H.	Pressure Altitude	O.A.T. °F	Engines		Gallons in Tank	I.A.S. M.P.H.	Pressure Altitude	O.A.T. °F	*Fluid Left in Tank	Fluid Dumped	Time for Dumping
						R.P.M.	M.P.							
(1) Power Off Glide (Engines Idling) - Speed at 1.4V _{s1}														
1														
2														
3														
4														
(2) Climb At One Engine Inoperative V _y Speed, Critical Engine Inoperative, Propeller In Minimum Drag Position On Remaining Engine(s)														
1														
2														
3														
4														
(3) Level Flight - Speed of 1.4V _{s1} - Test For This Condition Only If Tests (1) & (2) Indicate It May Be Critical.														
1														
2														
3														
4														

* Fluid remaining in tank must not be more than 20% of dumpable tank capacity.

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

E. Equipment and Operational Features:

9. Fuel Jettisoning System: (continued)

- .242
4b.437a) g. What is the time to jettison fuel from maximum takeoff weight to maximum landing weight? _____ minutes.
- (1) Is this time greater than 10 minutes?..... No Yes
- (2) If "yes", is the average rate of jettisoning fuel per minute not less than 1% of the maximum takeoff weight?.. Yes No
- .242
4b.437a) h. Is it demonstrated that flap extension does not adversely affect fuel jettisoning?..... Yes No
- (1) If "no", is a placard provided adjacent to the dumping control to warn flight personnel against dumping fuel while the flaps are extended?..... Yes No
- (2) Is a notation to this effect also included in the airplane operating manual?..... Yes No
- .242
4b.437) i. During above tests:
- (1) Does dumped fuel come in contact with any portion of airplane?..... No Yes
- (2) Does dumped fuel or fumes enter any portion of the airplane?..... No Yes
- (3) Is control of airplane adversely affected by dumping process?..... No Yes
- (4) Is there any evidence of leakage of valve after closing? No Yes
- .242
4b.437c) j. Is it possible to jettison fuel in the tanks used for take-off and landing below the level providing 45 minutes flight at 75% M.C. power?..... No Yes
- (1) If "yes", is an auxiliary control provided which is independent of the main jettisoning control to do this? Yes No

(If answer to any of these questions is underscored, describe fully under "Remarks".)

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

E. Equipment and Operational Features: (continued)

10. Pressurization of Cockpit and Cabin:

- a. Is pressurization provided for cockpit and/or cabin?
(Circle which)?..... Yes No
- b. If "yes", what are the following operational limits:
- (1) Maximum pressure differential that can be
maintained? _____ p.s.i.
- (2) Maximum pressure altitude for which the aircraft is
approved? _____ feet.
- (3) Considering items (a) and (b), what is the internal
pressure altitude that can be maintained at the maximum
operating altitude? _____ feet.
- 3.395(a) c. Are two pressure relief valves installed, at least one of
which is the normal regulating valve?..... Yes No
- 3.395(a) d. Is the positive pressure differential automatically limited
to a predetermined value during the maximum flow from the
pressure source?..... Yes No
- 3.395(a) e. Is there an appreciable rise in pressure when one relief
valve is inoperable?..... No Yes
- 3.395(b) f. Are reverse pressure differential relief valves installed
that will automatically prevent a negative differential that
would damage the structure?..... Yes No
- 3.395(c) g. Is a means provided by which the pressure differential can
be rapidly equalized?..... Yes No
- 3.395(d) h. Is a regulator installed to control the intake and/or
exhaust airflow so that the required internal pressure and
airflow rates can be maintained?..... Yes No
- This control is automatic _____, manual _____.
- 3.395(e) i. Are instruments provided to show the pilot the pressure
differential, the absolute cabin pressure, and the rate of
change of the absolute pressure?..... Yes No

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

E. Equipment and Operational Features:

10. Pressurization of Cockpit and Cabin: (continued)

- 3.395(f) j. Is a warning system provided for the pilot to show when the safe or preset limits on pressure differential and on absolute internal pressure are exceeded?..... Yes No
- 3.395(g) k. Is structure designed for pressure differentials up to the maximum relief valve setting in combination with landing loads?..... Yes No
- If "no", is a warning placard provided for the pilot?..... Yes No
- 3.396(b)(2) l. Do all parts of the pressurization system function properly under all possible conditions of pressure, temperature, and moisture up to the maximum altitude selected for certification?..... Yes No
- 3.396(b)(3) m. Do the pressure supply, pressure and flow regulators, indicators, and warning signals in steady and stepped climbs and descents at rates corresponding with the maximum attainable without exceeding the operating limitations of the airplane up to the maximum altitude selected for certification operate satisfactorily?..... Yes No
- 3.396(b)(4) n. Do all doors and emergency exits operate properly after being subjected to the flight tests in "m" above?..... Yes No
- o. Are provisions made to keep the windshield adequately clear of ice and fog at all intended operating altitudes?.. Yes No
- p. Are adequate controls and equipment provided for the satisfactory maintenance of the above?..... Yes No

3.10 11. Noise Survey of Cockpit:

- a. Does it appear that there is sufficient sound insulation in the cockpit so that the operating personnel would not be unduly affected as to interfere with the safe operation of the airplane?..... Yes No
- If an instrument is available, what is the maximum decible reading?_____

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

E. Equipment and Operational Features: (continued)

12. Time of Operation of Flaps and Landing Gear:

3.338 a. Time of operation of flaps: (With throttles closed, gear up, speed (at V_f) _____ M.P.H. I.A.S.)

(1) What is time to lower flaps from retracted to landing position? _____ seconds.

(2) What is time to lower flaps from retracted to landing position by emergency means? _____ seconds.

(3) What is time to raise flaps from landing position to fully retracted position? _____ seconds.

(4) What is time to raise flaps from landing position to fully retracted position by emergency means? _____ seconds.

3.358 b. Time of operation of landing gear: (At any desired power, flaps retracted, speed (at $1.6 V_{sl}$) _____ M.P.H. I.A.S.)

(1) What is time required to extend and lock landing gear from retracted position? _____ seconds.

(2) What is time required to retract landing gear? _____ seconds.

3.357 (3) What is the time required to extend and lock the landing gear by emergency means? _____ seconds.

(4) What is time required to retract the landing gear by emergency means? _____ seconds.

13. Auxiliary Powerplant:

3.652 a. Are auxiliary powerplant units installed?..... Yes No

(1) If "yes", is the starting and the operation satisfactory?..... Yes No

F. Flutter and Vibration:

1. Test at V_d (to be investigated in increments of progressively higher speeds).

a. Test Information and Data:

- (1) Are deicers installed?..... Yes No

If "yes" (See II E.2.a.)

- (2) Service propeller installed. (See II C.2.)

(Should be propeller having both largest diameter and highest static R.P.M. to be noted in aircraft specifications)

- (3) Maximum takeoff Wt. _____ lbs. at most rearward

C.G. _____ % MAC Ref.: Page _____ App. _____.

- (4) Is airplane trimmed for level flight at M.C. power or at full throttle?..... Yes No

- 3.419(b) (5) Is V_d obtained (with power optional but not exceeding 110% M.C. R.P.M.) using service propeller?..... Yes No

(High pitch may be used for controllable propeller)

If "no", what propeller was used to permit V_d ?

Make and Model _____

- (6) Maximum reading:

** Airspeed _____ M.P.H. I.A.S., _____ M.P.H. C.A.S.

Engine _____ R.P.M.

Manifold Pressure _____ in. Hg.

* Acceleration _____ G's.

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

F. Flutter and Vibration:

1. Test at V_d (continued)

3.159 b. During test were any of the following encountered:

3.311

- | | | |
|------------------------------------|----|------------|
| (1) Excessive tail buffeting?..... | No | <u>Yes</u> |
| (2) Excessive vibration?..... | No | <u>Yes</u> |
| (3) Flutter?..... | No | <u>Yes</u> |
| (4) Airfoil divergence?..... | No | <u>Yes</u> |
| (5) Control reversal?..... | No | <u>Yes</u> |

2. Test at V_{ne} for power off R.P.M. in glide with service props.

3.419(b) (Required only if service prop not used in obtaining V_d for above)

% V_{ne}	I.A.S. (M.P.H.)	C.A.S. (M.P.H.)	R.P.M.	*Maximum Acceleration
70				
80				
90				
100				

* Should not exceed maximum value on TIA.

Did service propeller cause engine R.P.M. to exceed 110% M.C.

R.P.M. with power off at V_{ne} ?.....NA No Yes

SECTION II. EQUIPMENT AND FLIGHT OPERATION:

F. Flutter and Vibration: (continued)

3. Test at V_f (flaps extended, landing position):

a. Test Information and Data:

(1) Maximum landing weight _____ lbs. at most rearward
C.G. _____ % MAC Ref.: Page _____ App. _____.

(2) Maximum readings:

** Airspeed _____ M.P.H. I.A.S., _____ M.P.H. C.A.S.

Engine _____ R.P.M.

* Acceleration _____ G's

Manifold Pressure _____ in. Hg.

b. During test were any of the following encountered:

(1) Excessive buffeting?.....	No	<u>Yes</u>
(2) Excessive vibration?.....	No	<u>Yes</u>
(3) Flutter?.....	No	<u>Yes</u>
(4) Airfoil divergence?.....	No	<u>Yes</u>
(5) Control reversal?.....	No	<u>Yes</u>

3.347 4. Spring Devices in Control Systems

a. If there are spring devices in the control systems and section II E.8.c.(3) is answered in the negative, were items F. 1 and 3 investigated with the spring disconnected and inactive?..... NA Yes No

(If "yes", were flutter and vibration characteristics satisfactory?)..... Yes No

* Should not exceed maximum value on TIA.

** If other than design value, explain under "REMARKS".

F. Flutter and Vibration: (continued)

F. Flutter and Vibration: (continued)

3.118

3.118(a)(4) a. *** Is any short period oscillation (about any axis) occurring between stalling speed (V_S) and maximum permissible speed (V_{ne}) heavily damped with the primary controls:

(1) Free.....	NA	Yes	No

(If answer is "yes", or "no", describe under "REMARKS")

* Should not exceed maximum value stated on pertinent TIA.

** If other than design value, explain reason under "REMARKS".

*** The test for this characteristic is to excite the individual control by a short sharp disturbance.

REMARKS

[illegible]

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SECTION III. POWERPLANT OPERATION

A. Fuel System:

3.437(b) 1. Unusable Fuel Supply:

3.437(a)

The Unusable Fuel Supply Is The Quantity Remaining In The Tank After First Evidence of Malfunctioning of Engine

	Condition	Tank #1 Gallons	Tank #2 Gallons	Tank #3 Gallons	Tank #4 Gallons	Tank #5 Gallons
	Indicate amount of fuel in Tank at Start of Each Test (Should be as Low as Practical)					
Note the critical unusable fuel and order of the conditions in being critical	1 Level Flight at M.C. power or at V_C , whichever is less including sideslips and skids of greatest severity likely to be encountered in normal service or turbulent air.					
	2 Climb at M.C. power at calculated best angle of climb at minimum weight including sideslips and skids of greatest severity likely to be encountered in normal service or turbulent air.					
	3 Transition to best rate of climb by rapid application of power following a power-off glide at $1.3 V_{SO}$ including sideslips and skids of greatest severity likely to be encountered in normal service or turbulent air.					

3.437(a) a. Is it desired that all the tanks feed the engine(s) in all conditions listed above?..... Yes No

(If "no", is each tank placarded against use in the conditions of flight not investigated?)..... Yes No

3.440 b. Is the unusable fuel supply in any tank greater than 5% of the tank capacity or 1 gallon?..... No Yes

(If "yes", is a placard and a suitable notation included in the airplane flight manual to indicate to the flight personnel that the fuel remaining in the tank when the indicator reads zero cannot be used safely in flight?).. Yes No

SECTION III. POWERPLANT OPERATION:

A. Fuel System: (continued)

2. Operation:

- 3.437(f) a. Is there any malfunctioning during takeoff and climb for one minute at the calculated attitude of best angle of climb at takeoff power and minimum weight using quantity of fuel in each tank that does not exceed the unusable fuel plus 0.03 gallons for each M.C. horsepower?..... No Yes
- 3.437(c) b. For "Utility Category Airplanes," is there any malfunctioning during the execution of all approved maneuvers included in the approved operating limitations? (The fuel in each tank shall not exceed the unusable fuel plus 0.03 gallons for each M. C. power)..... NA No Yes
- 3.437(d) c. For "Acrobatic Category Airplanes," is there any malfunctioning during the execution of all approved maneuvers included in the airplane flight manual. (The fuel in each tank shall not exceed the unusable fuel plus 0.03 gallons for M.C. power)..... NA No Yes
- 3.438 d. Does airplane have a suction lift fuel or other system conducive to vapor formation?..... Yes No
- If "yes", did any vapor lock occur when using fuel at a temperature of 110°F under the critical operating conditions? No Yes
- 3.437(e) e. Time to regain power: (more than one supply source involved). NA

(1) From level flight at M.C. power run dry on each tank, turn on another tank containing ample fuel:

(a) Is time to regain power acceptable?..... Yes No

(Not more than 10 seconds for single engine, 20 seconds for multiengine).

Tank Number Run Dry	Tank Number Turned On	TIME TO REGAIN POWER	
		Using Auxiliary Pump	Without Auxiliary Pump

SECTION III. POWERPLANT OPERATION: (continued)

B. Carburetor Air Heat Rise:

3.606 1. Test Data:

Airplane weight at takeoff (optional) _____ lbs., optional C.G. _____ % MAC and be flown in level flight at cruising mixture setting in air free of visible moisture. Ref.: Page _____ Appendix _____

NOTE: May be flown at only one altitude if O.A.T. of 30°F is Available	MINIMUM ALTITUDE						INTER-MEDIATE ALTITUDE						MAXIMUM ALTITUDE (75% MC Power or Full Throttle)					
	Full Throt- tle or MC Power*		90% IAS of Column #1		80% IAS of Column #1		Full Throt- tle or MC Power*		90% IAS of Column #1		80% IAS of Column #1		Full Throt- tle or MC Power*		90% IAS of Column #1		80% IAS of Column #1	
Carburetor Air Heat Control Position																		
Pressure Altitude(ft.)																		
O.A.T. (°F)																		
C.A.T. (°F)																		
Heat Rise																		
I.A.S. (M.P.H.)																		
R.P.M.																		
M.P. (In. Hg.)																		
Indicated B.H.P.																		
Pressure Correction Factor**																		
Std. Temperature for Pressure Altitude(°F)																		
Temperature Correction Factor																		
Actual B.H.P.																		
% Rated B.H.P.																		
Throttle Position																		

*Supercharged Engines Only.

**For Sea Level Engines

SECTION III. POWERPLANT OPERATION:

B. Carburetor Air Heat Rises: (continued)

2. Test Results (corrected to correct power and outside air temperature)

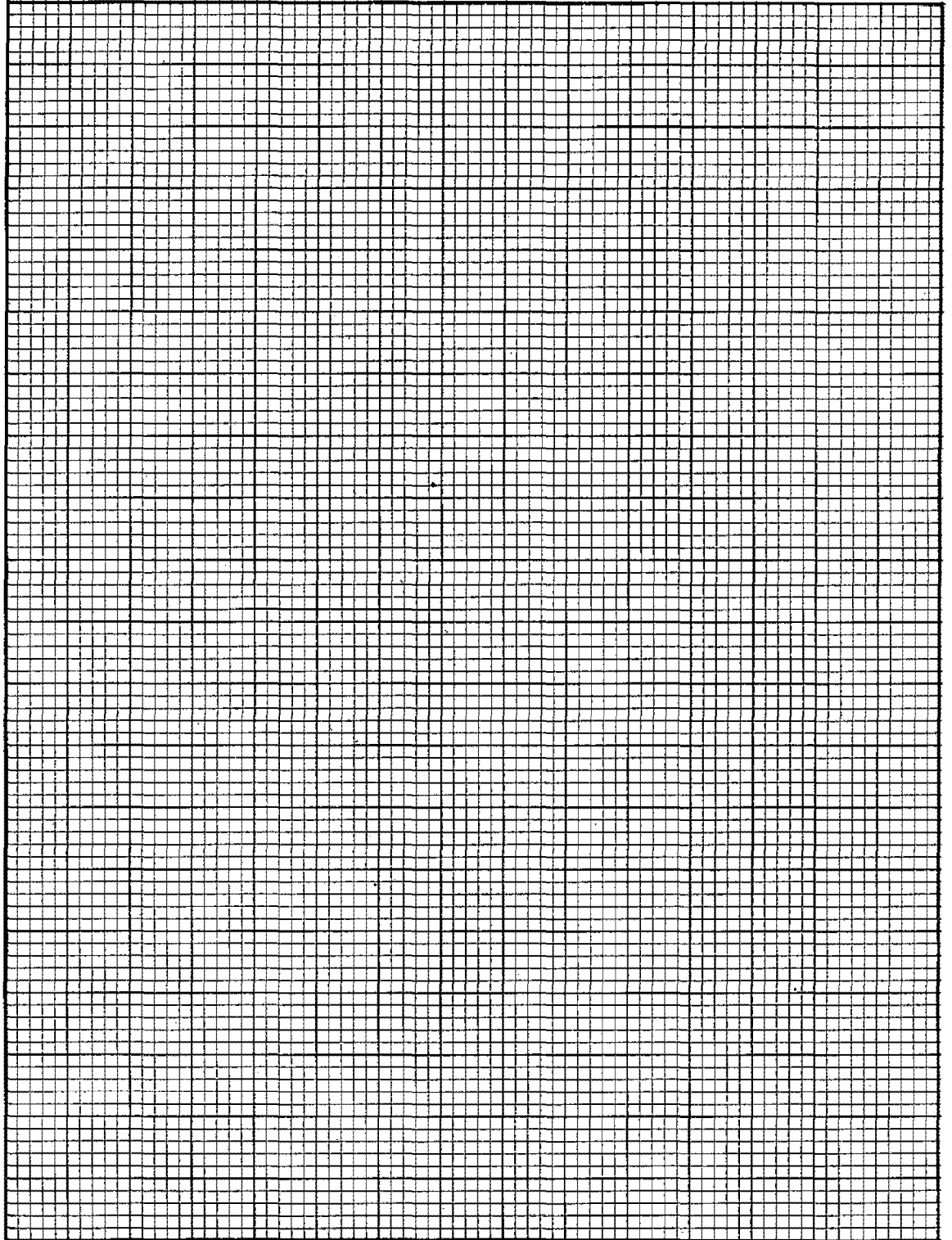
	Type Engine (& Carb.)	Required Heat Rise At 30°F O.A.T.	Actual Heat Rise At 30°F O.A.T.	Requirements Met
3.606(a)	Sea level (Venturi)	90°F at 75% M.C. power		NA Yes <u>No</u>
3.606(d)	Single engine Sea level (non ice prone)	Sheltered alternate air source with preheat at least that of engine cylinder downstream air, or equivalent.		NA Yes <u>No</u>
3.606(e)	Multiengine Sea level (non ice prone)	90°F at 75% M.C. power		NA Yes <u>No</u>
3.606(b)	Altitude (Venturi)	120°F at 75% M.C. power		NA Yes <u>No</u>
	Altitude (non ice prone)	100°F at 60% M.C. power or 40°F with fluid deicing system		NA Yes <u>No</u>

3. For multiengine airplanes, were above results obtained from the
critical engine (least carburetor air heat rise)?..... NA Yes No

CARBURETOR AIR HEAT RISE AT _____ % RATED B.H.P.
AND 30°F OUTSIDE AIR TEMPERATURE

B.H.P. _____ % M.C. POWER

OUTSIDE AIR TEMPERATURE °F



CARBURETOR AIR HEAT RISE °F

SECTION III. POWERPLANT OPERATION: (continued)

3.581 C. Cooling:

1. Climb Conditions (in air free of visible moisture):

3.582

a. Takeoff weight (max.) _____

C.G. (optional) _____ % MAC Ref.: Page _____

Appendix _____

b. Fuel Grade _____ (minimum approved for engine)

c. Mixture Setting _____ (should be same as used in normal operations)

d. Engine Power:

(1) _____ R.P.M.

(2) Manifold Pressure _____ in. Hg.

e. Propeller Model (See II C.2.a.)

f. Cowl Flap Position _____ (should be same as used in establishing M.C. power climb)

g. Has engine more than one stage blower?..... No Yes

(If "yes", are cooling tests performed and submitted for each blower stage?)..... Yes No

h. If a multiengine airplane, is inoperative propeller in minimum drag condition?..... NA Yes No

Also complete the following:

Which engine is inoperative? _____

Hottest cylinder head on which engine? _____

Hottest cylinder barrel on which engine? _____

SECTION III. POWERPLANT OPERATION:

C. Cooling:

1. Climb Conditions (in air free of visible moisture): (continued)

3.583-1 i. Is "winterization" equipment installed?..... Yes No

If "yes", answer the following:

- (1) What is applicant's selected maximum temperature _____ °F
- (2) Is this value used in lieu of the 100°F hot day in correction of test data to maximum anticipated temperatures?..... Yes No
- (3) Does the AFM clearly indicate that the winterization equipment must be removed whenever the temperature reaches the limit for which approved?..... Yes No
- (4) Is the cockpit placarded similarly (with item (3) information)?..... Yes No
- (5) Is airplane equipped with an outside air temperature gage or with a cylinder/barrel/oil gage (whichever is critical)?..... Yes No

3.586 j. Cooling test procedure requirements (strike out nonapplicable
(3-2) sections):

(1) For Sea Level Engines, Single Engine Airplane:

After stabilizing engine temperatures in flight with engines operating at not less than 75% MCP, start at lowest practicable altitude and climb for one minute at takeoff power; continue climb at full throttle until at least 5 minutes after the occurrence of the highest temperature recorded:

- Is climb conducted at a speed greater than best R/C speed?..... No Yes
- (a) If "yes", is the slope of the flight path at the cooling speed equal to or greater than the minimum required angle of climb?..... Yes No
- (b) If "yes", is a cylinder head temperature indicator provided?..... Yes No

SECTION III. POWERPLANT OPERATION:

C. Cooling:

1. Climb Conditions (in air free of visible moisture)

j. Cooling test procedure requirements (strike out nonapplicable sections): (continued)

(2) For Supercharged Engines, Single Engine Airplane:

After stabilizing engine temperature in flight with engine operating at not less than 75% MCP, tests for each blower stage should start at 1,000 feet below the actual engine critical altitude of each stage and continue at least 5 minutes after the occurrence of the highest temperature recorded:

Is climb conducted at a speed greater than best R/C speed?..... No Yes

(a) If "yes", is the slope of the flight path at the cooling speed equal to or greater than the minimum required angle of climb?..... Yes No

(b) If "yes", is a cylinder head temperature indicator provided?..... Yes No

3.587(a)

(3) For multiengine airplanes that meet the minimum one engine inoperative climb performance:

With the airplane in the configuration that was used in establishing the critical engine inoperative climb performance, the operating engine(s) at M.C. power or at full throttle (above the critical altitude), and after the temperatures are stabilized in flight with engines operating at not less than 75% MCP the climbs, for each blower stage, shall be started at the lower of the two following altitudes, and continued for 5 minutes after the first occurrence of the highest temperature:

1,000 feet below the actual engine critical altitude of the lowest practicable altitude (when applicable);

1,000 feet below the altitude at which the single-engine inoperative rate of climb is $0.02 V_{SO} 2$.

Is climb conducted at a speed not over the speed used in establishing the one engine inoperative climb performance?..... Yes No

If "yes", is a cylinder head temperature indicator provided?..... Yes No

SECTION III. POWERPLANT OPERATION:

C. Cooling:

1. Climb Conditions: (in air free of visible moisture)

j. Cooling test procedure requirements (strike out nonapplicable sections):

3.587(a)

(3) For multiengine airplanes that meet the minimum one engine inoperative climb performance: (continued)

- (a) If speed exceeds the best rate of climb speed with one engine inoperative, is a cylinder head temperature indicator provided for each engine?.... NA Yes No

(For high blower cooling, the minimum altitude for start of climb need not be lower than the lowest approved altitude for high blower operation.)

3.587(b)

3.587-1

(4) For multiengine airplanes that cannot meet the minimum one engine inoperative: (for airplanes having positive climb)

After stabilizing temperature in flight with engines operating at not less than 75% M.C. power, the climb shall be commenced at as near sea level as practicable for low blower and shall be conducted at the best rate of climb speed.

(5) For multiengine airplanes that cannot meet the minimum one engine inoperative: (for airplanes with zero climb or a rate of sink)

While stabilizing temperature in level flight at the lowest practical altitude above the ground with engines operating at not less than 75% M.C. power, use M.C. power on test engine and sufficient power on remaining engine(s) to maintain level flight at the speed for minimum rate of descent. When temperature is thus stabilized reduce power on remaining engine(s), maintain speed for minimum rate of descent, and record test data.

Is climb or descent conducted at best one-engine inoperative rate of climb or minimum rate of descent speed?.. Yes No

(For high blower cooling, the altitudes for conducting these tests should be that approved for high blower operation.)

SECTION III. POWERPLANT OPERATION:

C. Cooling:

1. Climb Conditions (in air free of visible moisture): (continued)

k. Climb Test Data:

[illegible]

SECTION III. POWERPLANT OPERATION:

C. Cooling:

1. Climb Conditions (in air free of visible moisture): (continued)

3.583 1. Climb Test Results:

3.584

3.585

		(1) Cylinder Head No. _____	(2) Barrel or Base No. _____	(3) Oil Inlet
(a)	Maximum Observed Temperature (°F)			
(b)	True Observed Temperature (°F)			
(c)	Pressure Altitude (Ft.)			
(d)	Observed O.A.T. (°F)			
(e)	True O.A.T. (°F)			
(f)	Corrected Temperature (°F)	*	**	***
(g)	Maximum Permissible Temperature (°F)			
(h)	Is Temperature Satisfactory?	Yes <u>No</u>	Yes <u>No</u>	Yes <u>No</u>

* Corrected Head Temperature = (1)(b) _____ + 100 - 0.0036 x (1)(c) _____

- (1)(e) _____ = _____.

** Corrected Barrel Temperature = (2)(b) _____ + 0.7 $\sqrt{100 - 0.0036 \times (2)(c)}$ _____

- (2)(e) _____ $\sqrt{}$ = _____.

*** Corrected Oil Inlet Temperature = (3)(b) _____ + 100 - 0.0036 x (3)(c) _____

- (3)(e) _____ = _____.

Are all calibration curves attached?..... Yes No

SECTION III. POWERPLANT OPERATION:

C. Cooling: (continued)

582-1 2. Water Taxiing Conditions: (applicable to flying boats only)

a. Takeoff Weight (maximum) _____ C.G. _____ % MAC

Ref.: Page _____ Appendix _____

b. Fuel Octane No.: _____ (minimum approved for engine.)

c. Mixture Setting _____ (normal setting for power used).

d. Cowl Flap Position _____ (may be best setting for cooling).

e. If multiengine, complete the following:

Hottest cylinder head is on which engine? _____

Hottest cylinder barrel is on which engine? _____

Highest oil inlet temperature is on which engine? _____

f. Test procedure and data

After stabilizing cylinder and oil inlet temperature, taxi downwind for 10 minutes at 5 M.P.H. above the step speed, and record data below:

Time (Minutes)	Pressure Altitude (Ft.)	Observed Temperature °F				Operating Engine(s)			Speed of Test	
		O.A.T.	Head No. _____	Barrel No. _____	Oil	M.P. in. Hg.	R.P.M.	C.A.T. °F	M.P.H.	

SECTION III. POWERPLANT OPERATION:

C. Cooling:

2. Water Taxiing Conditions: (applicable to flying boats only) (continued)

3.583 g. Water Taxiing Test Results:

3.584

3.585

	(1) Cylinder Head No. _____	(2) Barrel or Base No. _____	(3) Oil Inlet
(a) Maximum Observed Temperature (°F)			
(b) True Observed Temperature (°F)			
(c) Pressure Altitude (Ft.)			
(d) Observed O.A.T. (°F)			
(e) True O.A.T. (°F)			
(f) Corrected Temperature (°F)	*	**	***
(g) Maximum Permissible Temperature (°F)			
(h) Is Temperature Satisfactory?	Yes <u>No</u>	Yes <u>No</u>	Yes <u>No</u>

* Corrected Head Temperature = (1)(b) _____ + 100 - 0.0036 x (1)(c) _____
 - (1)(e) _____ = _____.

** Corrected Barrel Temperature = (2)(b) _____ + 0.7 $\sqrt{100}$ - 0.0036 x (2)(c) _____
 - (2)(e) _____ = _____.

*** Corrected Oil Inlet Temperature = (3)(b) _____ + 100 - 0.0036 x (3)(c) _____
 - (3)(e) _____ = _____.

h. Are all calibration curves attached?..... Yes No

SECTION III. POWERPLANT OPERATION: (continued)

D. Test For Carbon Monoxide:

- 1. Airplane may be at any convenient weight and C.G. position.
- 2. Using a "CO" indicator reading instrument, record the values for the following tests:

3.615	<u>CLIMB</u>	<u>CRUISE</u>	<u>GLIDE</u>			
3.393	M.C. Power or Full Throttle Speed 1.4 Vsl Mixture Full Rich	75% M.C. Power Mixture _____	Engine(s) throttled Speed 1.4Vsl Flaps Up			
	Windows and/or Vents					
	Partly open	Closed	Partly open	Closed	Partly open	Closed
a. Maximum Reading (Cockpit):						
(1) Along Windows and/or Vents						
(2) Along Floor						
(3) Front of Instrument Panel						
(4) Front of Pilots Face						
b. Maximum Reading (Cabin):						
(1) Front						
(2) Center						
(3) Rear						
3.388	<u>AUXILIARY POWER UNIT</u>	<u>HEATERS</u>	<u>OTHERS</u>			
	Installed? No Yes	Installed? No Yes				
c. With Tester Directly in Front of Unit While Unit is Operating						

3. Does any of the above readings exceed 0.005 of 1 per cent?..... No Yes

SECTION IV. PERFORMANCE

A. Airspeed Calibration:

1. Over Speed Course

a. Weight _____ lbs. (Max. T.O. Weight)

C.G. _____ % MAC (Intermediate) Ref.: Pages _____ Appendix _____

b. Course Distance _____ Ft. (At least two miles)

c. Pressure Altitude _____ Ft. (Altimeter set to 29.92")

d. Are at least 5 complete runs conducted for each flap position?... Yes No

(Landing gear should be extended when flaps are extended).

[illegible]

$$\text{* Course Speed (M.P.H.)} = \frac{0.6818 \times \text{Course Distance (Ft.)}}{\text{Time (Seconds)}}$$

$$** \text{ Factor} = \sqrt{\frac{P}{P_0}} = 4.16 \sqrt{\frac{\text{Observed Pressure (In. Hg.)}}{460 + \text{Observed Temperature } ^\circ\text{F}}} \text{ (Or read from chart)}$$

SECTION IV. PERFORMANCE:

A. Airspeed Calibration:

2. Airspeed Boom or Trailing Bomb:

3.663 a. Weight _____ lbs. (Max. T.O. Weight);

C.G. _____ % MAC (Intermediate) Ref.: Pages _____ Appendix _____

b. Boom or Bomb Data:

(1) Length of Cable _____ Ft. (At least one wingspan)

(2) Is boom or bomb balanced for lag?..... Yes No

(3) Boom or bomb Serial No. _____ Boom or bomb Airspeed

Instrument No. _____

3.65 (4) Has this combination been calibrated within the past six months?..... Yes No

(5) Is calibration attached?..... Yes No

Reference _____

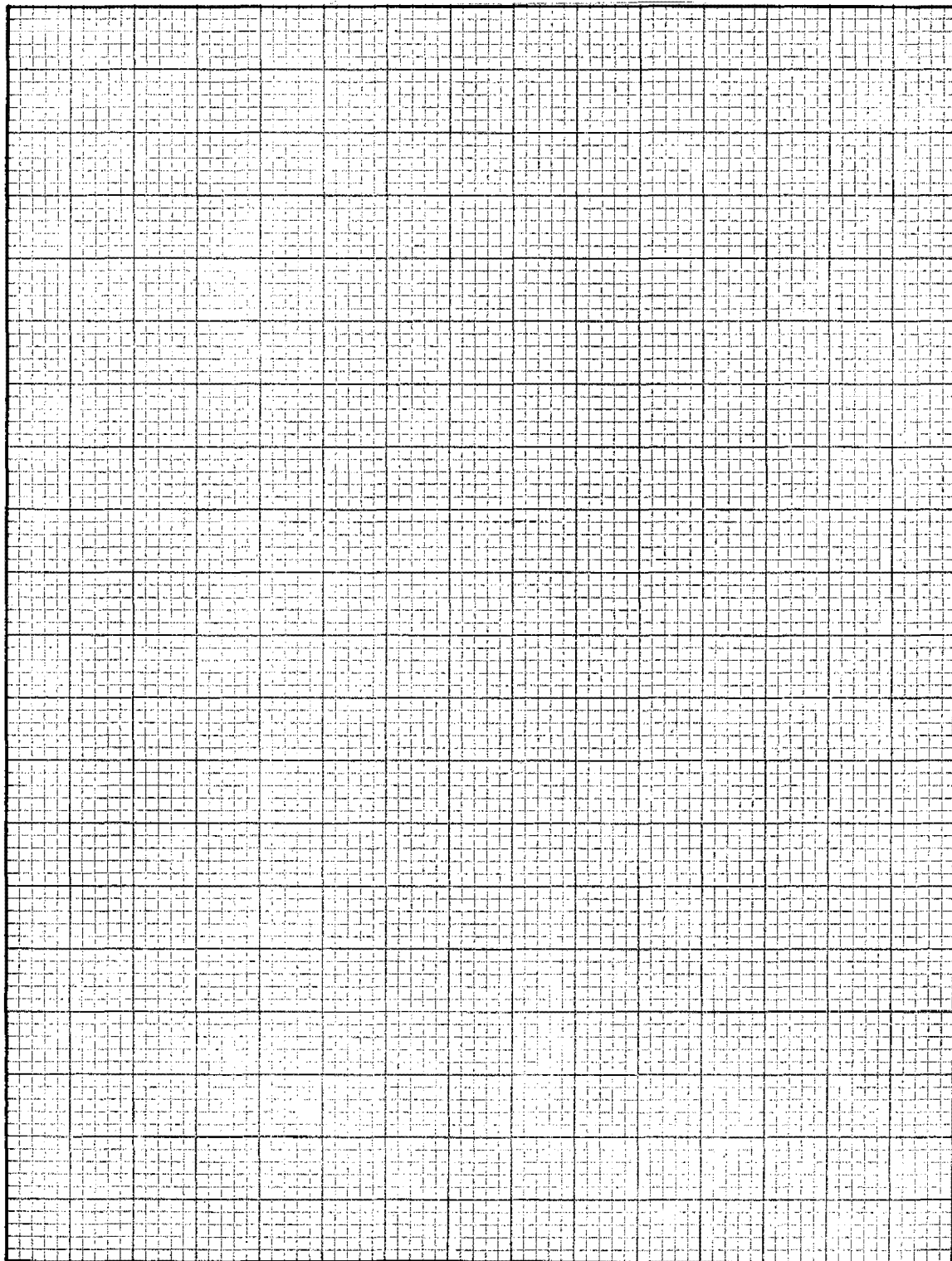
(6) If no, where is calibration curve filed? _____

c. Are at least 5 runs conducted for each flap setting?..... Yes No

(Landing gear should be extended when flaps are extended).

d. Is at least one run conducted in level flight at 75% M.C. power? Yes No

AIRPEED INSTALLATION CALIBRATION CURVE



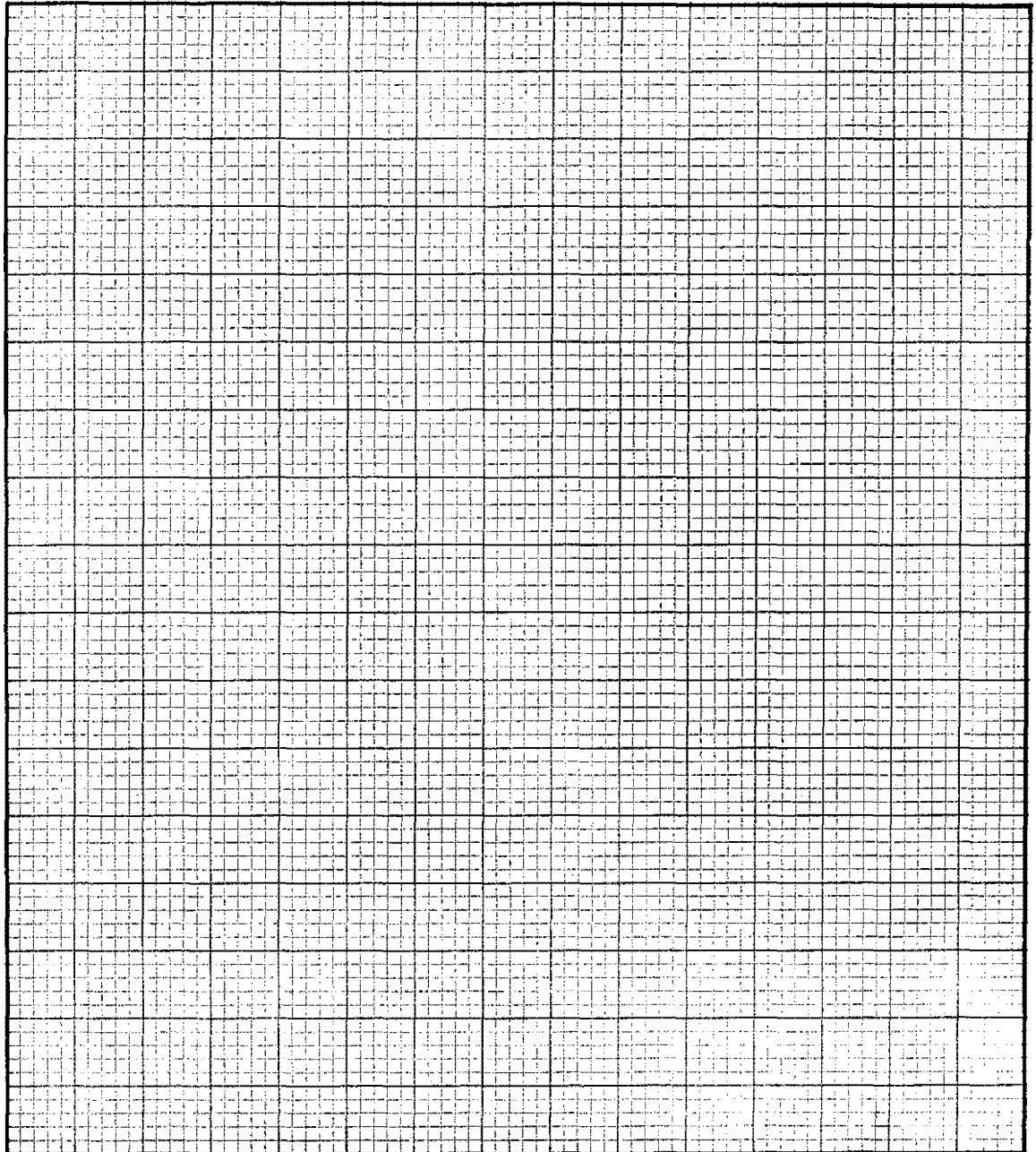
INDICATOR READING (M.P.H.)

AIRSPPEED CALIBRATION CURVE
POSITION ERROR ONLY

(Difference between "airplane airspeed instrument" calibration and the "airplane airspeed installation" calibration).

Is airplane airspeed instrument calibration attached?.....Yes No
Reference _____

CALIBRATED READING (M.P.H.)



INDICATOR READING (M.P.H.)

SECTION IV. PERFORMANCE:

A. Airspeed Calibration: (continued)

B.663 3. With flaps and gear up, and throughout range from V_C (_____
 _____ M.P.H., C.A.S.) to $1.3 V_{S1}$ (_____ M.P.H., C.A.S.),
is the installational error greater than plus or minus 3% of the
C.A.S. or 5 M.P.H. (Whichever is greater)?..... No Yes

B.663 4. With flaps and gear down, and at $1.3 V_{S1}$ (_____ M.P.H., C.A.S.)
is the installational error greater than plus or minus 3% of the
C.A.S. or 5 M.P.H. (Whichever is greater)?..... No Yes

B. Airflow Variation

B.665 Are the airspeed indicator, altimeter and any other instruments which
are provided with static air case connections influenced by the air-
plane attitude, opening and closing of windows or any condition of
airflow variation such that their accuracy is seriously affected.
(Give details below)..... No Yes

REMARKS

3.82 C. Determination of Stalling Speed (V_{so}):
3.120

a. Were deicers installed? (See II E.2)..... No Yes

b. Are engines idling with throttles closed and not more than zero thrust?..... Yes No

c. Are propeller pitch controls in position normally used for takeoff?..... Yes No

d. Are cowl flaps closed?..... NA Yes No

e. Is landing gear extended?..... Yes No

f. Is airplane trimmed to straight flight at a ± 3 M.P.H. or 3% of 1.5 V_{sl} or minimum trim speed, whichever is greater? Yes No

[illegible]

SECTION IV. PERFORMANCE:

C. Determination of Stalling Speed (V_{so}): (continued)

2. At Most Forward Center of Gravity Position:

a. Weight _____ lbs. (Max. T.O. Weight); C.G. _____ % MAC (Most

Forward); Ref.: Page _____ Appendix _____

Wing Flap Angle	Time	Weight At Test W ₁ Lbs.	Trim Speed M.P.H. C.A.S.	Prop. Pitch Low or Deg.	Engine R.P.M.	I.A.S. Where One MPH/Sec. Is First Obtained	Test Airspeed At Stall V ₁ - M.P.H.		$\sqrt{\frac{W}{W_1}}$	V _{so} = V ₁ $\sqrt{\frac{W}{W_1}}$ M.P.H. C.A.S.
							I.A.S.	C.A.S.		
Landing Flap										
_____°										
Inter- mediate Flap										
_____°										
Inter- mediate Flap										
_____°										
Inter- mediate Flap										
_____°										
No Flap										
_____°										

b. Is airplane unstallable?..... No Yes

If "yes", what is the minimum steady flight speed at which the
airplane is controllable? _____ C.A.S. M.P.H.

SECTION IV. PERFORMANCE:

C. Determination of Stalling Speed (V_{so}): (continued)

3. At Most Rearward Center of Gravity Position:

a. Weight _____ Lbs. (Max. T.O. Weight); C.G. _____ % MAC (Most

Rearward); Ref.: Page _____ Appendix _____

Wing Flap Angle	Time	Weight At Test W_1 Lbs.	Trim Speed M.P.H. C.A.S.	Prop. Pitch Low or Deg.	Engine R.P.M.	I.A.S. Where One MPH/Sec. Is First Obtained	Test Airspeed At Stall V_1 - M.P.H.		$\sqrt{\frac{W}{W_1}}$	$V_{so} =$ $V_1 \sqrt{\frac{W}{W_1}}$ M.P.H. C.A.S.
							I.A.S.	C.A.S.		
Landing Flap ____°										
Inter- mediate Flap ____°										
Inter- mediate Flap ____°										
Inter- mediate Flap ____°										
No Flap ____°										

b. Is airplane unstallable?..... No Yes

If "yes", what is the minimum steady flight speed at which the
airplane is controllable? _____ M.P.H. C.A.S.

3.83 4. For single engine airplanes, does V_{so} at maximum takeoff weight and
with landing flap exceed 70 M.P.H. C.A.S.? NA No Yes

SECTION IV. PERFORMANCE: (continued)

D. Determination of Critical Inoperative Engine:

.85(b)

.85a(b) 1. At Takeoff

a. Weight _____ lbs. (any convenient weight);

C.G. _____ % MAC; Ref.: Page _____

Appendix _____

b. Propeller (See II C.2.)

c. Were deicers installed?..... No Yes

If "yes" (See II E.2.)

d. Mixture setting _____ (should be same as in cooling test)

e. Cowl flap setting _____ (should be same as in cooling test)

f. Time of takeoff _____

2. Observed Flight Test Data:

a. Is the landing gear retracted?.....Fixed Yes No

b. Is the inoperative propeller in the minimum drag position. Yes No

(1) What is this position? _____

c. Are the remaining engines operating at M.C. power?..... Yes No

SECTION IV. PERFORMANCE:

D. Determination of Critical Inoperative Engine:

2. Observed Flight Test Data: (continued)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)		(9)	(10)	(11)**
Inoperative * Engine		Time	Pressure Altitude Feet	Pressure Altitude at 1/2 Minute	C.A.T. °F	C.A.T. °F	Operating Eng.		Approx. Best R/C Speed I.A.S.	C.A.S.	Wt. & Obs. R/C
							M.P. in.Hg.	R.P.M.			
RPM	a										Wt.
	b										
	c										R/C
	d										
	e										
	f										
RPM	a										Wt.
	b										
	c										R/C
	d										
	e										
	f										
RPM	a										Wt.
	b										
	c										R/C
	d										
	e										
	f										
RPM	a										Wt.
	b										
	c										R/C
	d										
	e										
	f										

* Indicate inoperative engine by Left Outboard (LO), Left Inboard (LI), Right Inboard (RI), Right Outboard (RO); also R.P.M. of inoperative propeller.
(After stabilizing airplane, conduct above tests at approximately identical altitudes. Altitude readings should be made at one minute intervals for five minutes)

** Observed rate of climb = $\frac{(4)f - (4)a}{(3)f - (3)a}$

e. Which inoperative engine is critical? _____

SECTION IV. PERFORMANCE:

3.85 E. Climbs:

1. General Data:

a. Were deicers installed? (If "yes" (See II.E.2.))..... No Yes

b. Propeller (See II.C.2.)

c. Mixture setting _____ (Should be same as in cooling test)

3.85(a) 2. Normal Climb (all engines operating): (Desired, but not required for airplane 6,000 lbs. or less)

a. Is landing gear retracted?.....Fixed Yes No

3.85-2 b. Are wing flaps in T.O. position?..... NA Yes No

(1) What is flap position? _____ degrees.

c. Are engines operating at not more than M.C. power?..... Yes No

d. Weight _____ lbs. (Max. T.O. Weight)

C.G. _____ % MAC Ref.: Page _____ Appendix _____

e. Cowl flap setting _____ (Should be same as in cooling test)

f. Results (from chart on next page)

g. What is observed R/C at sea level? _____ Ft./Min.

*h. What is corrected R/C at sea level? _____ Ft./Min.

i. What is actual angle of climb (expressed as a ratio)? _____

j. Is steady R/C at sea level greater than 300 Ft./Min.?..... Yes No

k. Is steady angle of climb greater than 1:12 for landplanes or 1:15 for seaplanes?..... Yes No

l. Are data for inclusion in the operating limitations submitted to indicate variations in climb for a variation in altitude from S.L. to 7000 feet and air temperature from 0°F to 100°F? (Seaplanes need not show temperatures below 30°F at altitudes above 1000 feet)..... Yes No

(1) Is this graph also attached to this TIR?..... Yes No

*See Page 101.

SECTION IV. PERFORMANCE:

3.85 E. Climbs:

2. Normal Climb (all engines operating): (Desired, but not required for airplane 6,000 lbs. or less) (continued)

	Time	Pressure Altitude (Feet)		O.A.T. °F	C.A.T. °F	I.A.S. M.P.H.	Engine R.P.M.	M.P. in. Hg.	Weight lbs.
		Ea. Min.	Ea. 1/2 Min.						
Climb #1									
Climb #2									
Climb #3									
Climb #4									
Climb #5									
HS*									

* Record high speed run in level flight at intermediate altitude
(Use additional data sheets in appendix when required)

* (from page 100)

Corrected R/C = $R/C_{obs} \cdot T_{amb}/T_{std}$ at test day true airspeed.

Corrected R/C = $R/C_{obs} \cdot \sqrt{T_{std}/T_{amb}}$ at standard day true airspeed.
(final value to be used)

CURVES FOR DETERMINING THE BEST RATE OF CLIMB AND SPEED
NORMAL CLIMB - ALL ENGINES OPERATING

85(a)

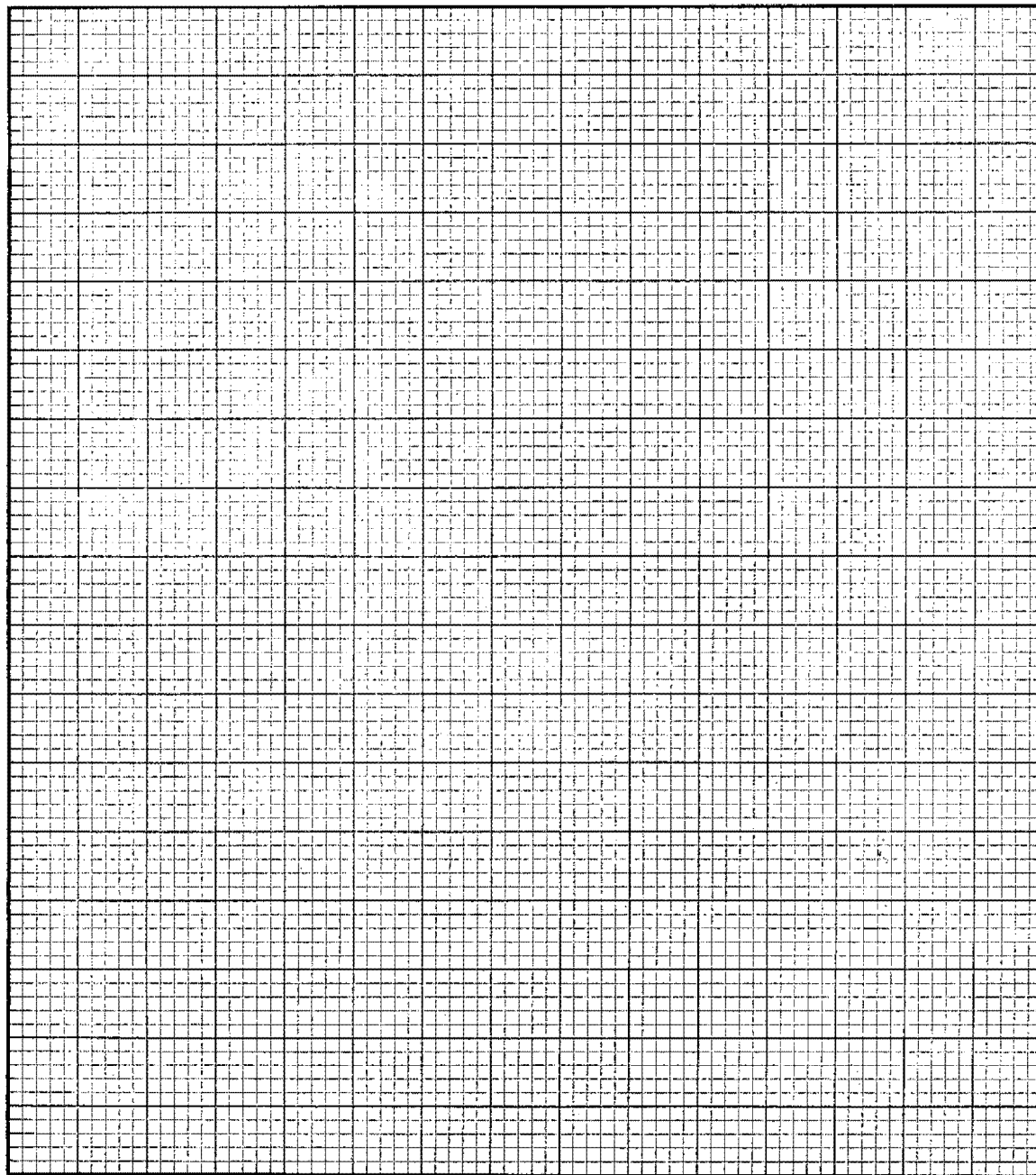
Landing Gear Position _____

Weight _____ lbs.

Wing Flap Position _____

Cowl Flap Position _____

Power _____

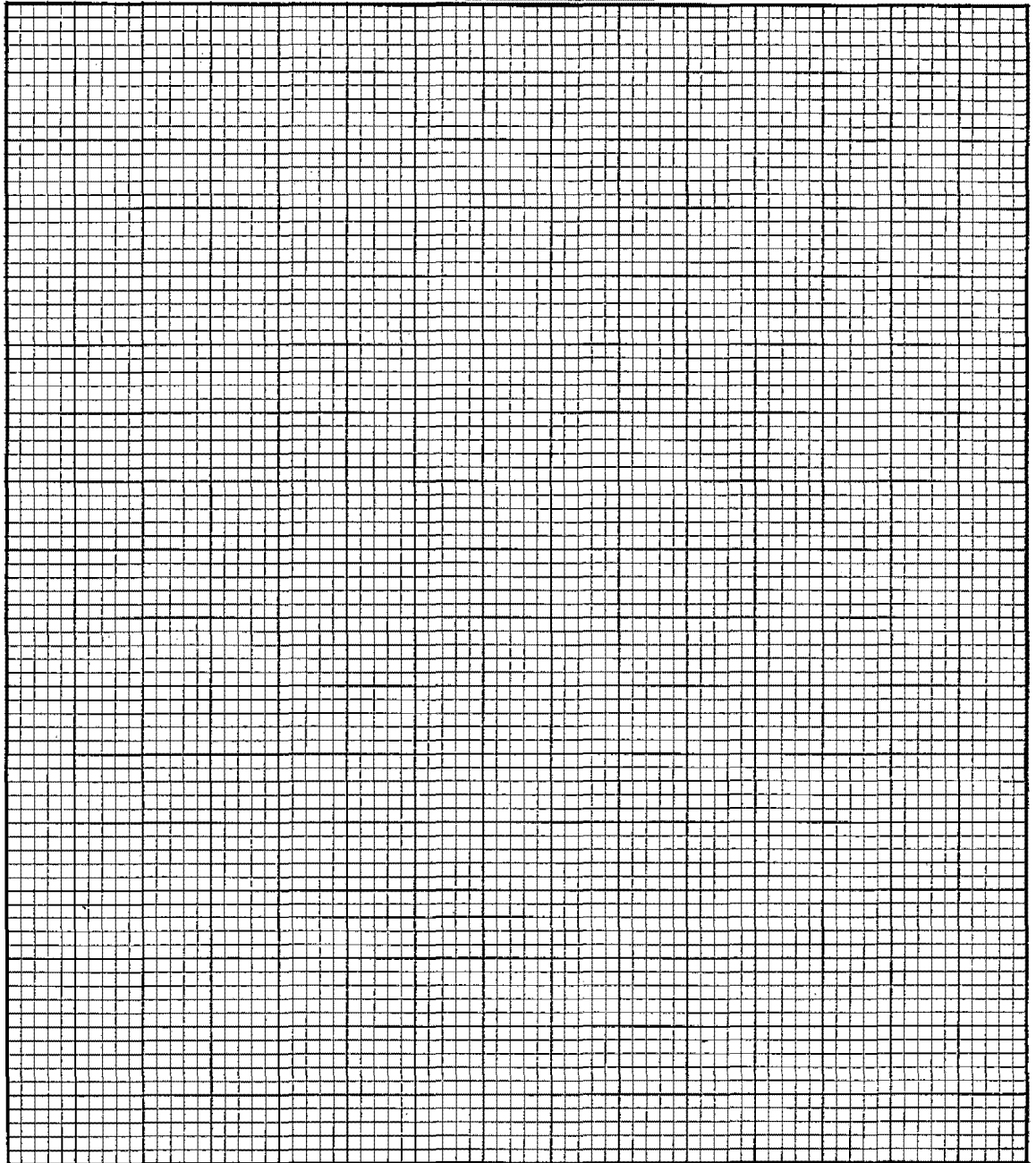


CALIBRATED AIRSPEED (M.P.H.)

NORMAL CLIMB PERFORMANCE - ALL ENGINES OPERATING

3.85(a) Landing Gear Position _____ Weight _____ lbs.
Wing Flap Position _____ Cowl Flap Position _____
Power _____

DENSITY ALTITUDE (feet)



BEST RATE OF CLIMB
(ft/min)

BEST R/C SPEED
M.P.H. C.A.S.

SECTION IV. PERFORMANCE:

E. Climbs: (continued)

3.85(b) 3. Critical Engine Inoperative Climb:

3.85a(b) a. Is landing gear retracted?.....Fixed Yes No

b. Are wing flaps in the most favorable position for climb? NA Yes No

(1) What is flap position? _____ degrees

c. Which is the inoperative engine? _____

(1) Is the inoperative propeller in the minimum drag position?..... Yes No

(a) What is this position? _____

d. Are remaining engines operating at not more than M.C. power? Yes No

e. Weight _____ lbs. (Max. T.O. Weight);

C.G. _____ % MAC; Ref.: Page _____ Appendix _____

f. Cowl flap setting _____ (must be same as in cooling test)

g. (Use chart on next page)

h. What is observed R/C at 5000 Ft.? _____ Ft./Min.

i. What is corrected R/C at 5000 Ft.? _____ Ft./Min.

3.85((At 5000 Ft. required R/C is $0.02 V_{so}^2 =$ _____ Ft./Min.)
(V_{so} , critical value from item IV, C. with landing flap)

j. If maximum T.O. Weight is over 6000 lbs., is critical engine inoperative climb at 5000 ft. satisfactory?..... NA Yes No

3.83 k. If V_{so} exceeds 70 M.P.H., is the critical engine inoperative climb at 5000 ft. satisfactory?..... NA Yes No

3.780(c) l. Are data for inclusion in the operating limitations submitted to indicate variation in climb for a variation in altitude from S.L. to 8000 ft. and a temperature range of 60°F below the standard temperature to 40°F above the standard at the altitude involved?..... NA Yes No

(1) Is this graph also attached to this TIR?..... NA Yes No

SECTION IV. PERFORMANCE:

E. Climbs:

3.85(b) 3. Critical Engine Inoperative Climb: (continued)

	Time	Pressure Altitude (Feet)		O.A.T. °F	C.A.T. °F	I.A.S. M.P.H.	Engine R.P.M.	M.P. in. Hg.	Dead Engine		Weight & Obs. R/C
		Ea. Min.	Ea. 1/2 Min.						R.P.M.	Pitch	
Climb #1											
Climb #2											
Climb #3											
Climb #4											
Climb #5											
HS *											

* Record high speed run in level flight at intermediate altitude

(Use additional data sheets in appendix when required)

SECTION IV. PERFORMANCE:

E. Climbs:

3. Critical Engine Inoperative Climb: (continued)

- 7.31 m. If airplane is to be eligible for air taxi operations, is information attached (format indicated below) which gives the maximum authorized weight for the corresponding terrain elevations which will still permit, in the event of a critical inoperative engine and with the airplane in its most favorable en route configuration, a minimum terrain clearance of at least 1000 ft. and a minimum of 50 ft./minute climb?.... NA Yes No

PERFORMANCE - Inoperative propeller in minimum drag position, flaps and gear up.

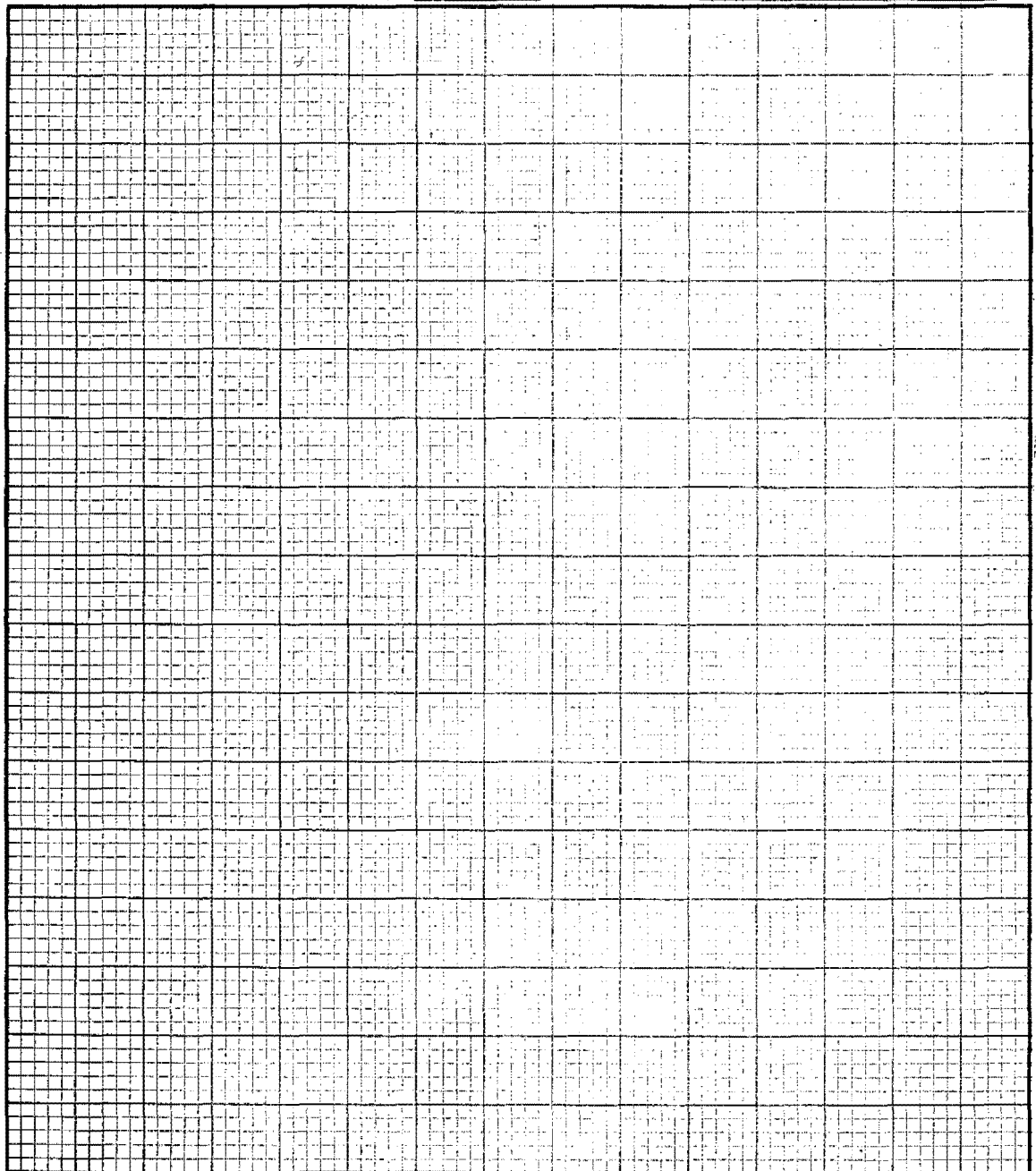
Model	Maximum Authorized Weight (lbs.)	Climb Speed (MPH - CAS)	Highest Terrain (ft.) (To permit minimum of 1,000 ft. clearance and 50 ft./min. rate of climb)

CURVES FOR DETERMINING THE BEST RATE OF CLIMB AND SPEED

CRITICAL ENGINE INOPERATIVE

3.85(b) Landing Gear Position _____ Weight _____ lbs. _____
 Wing Flap Position _____ Cowl Flap Position _____
 Critical Inoperative Engine _____ Power _____

CORRECTED RATE OF CLIMB (ft/min)



CALIBRATED AIRSPEED (M.P.H.)

CLIMB PERFORMANCE - CRITICAL ENGINE INOPERATIVE

Landing Gear Position _____

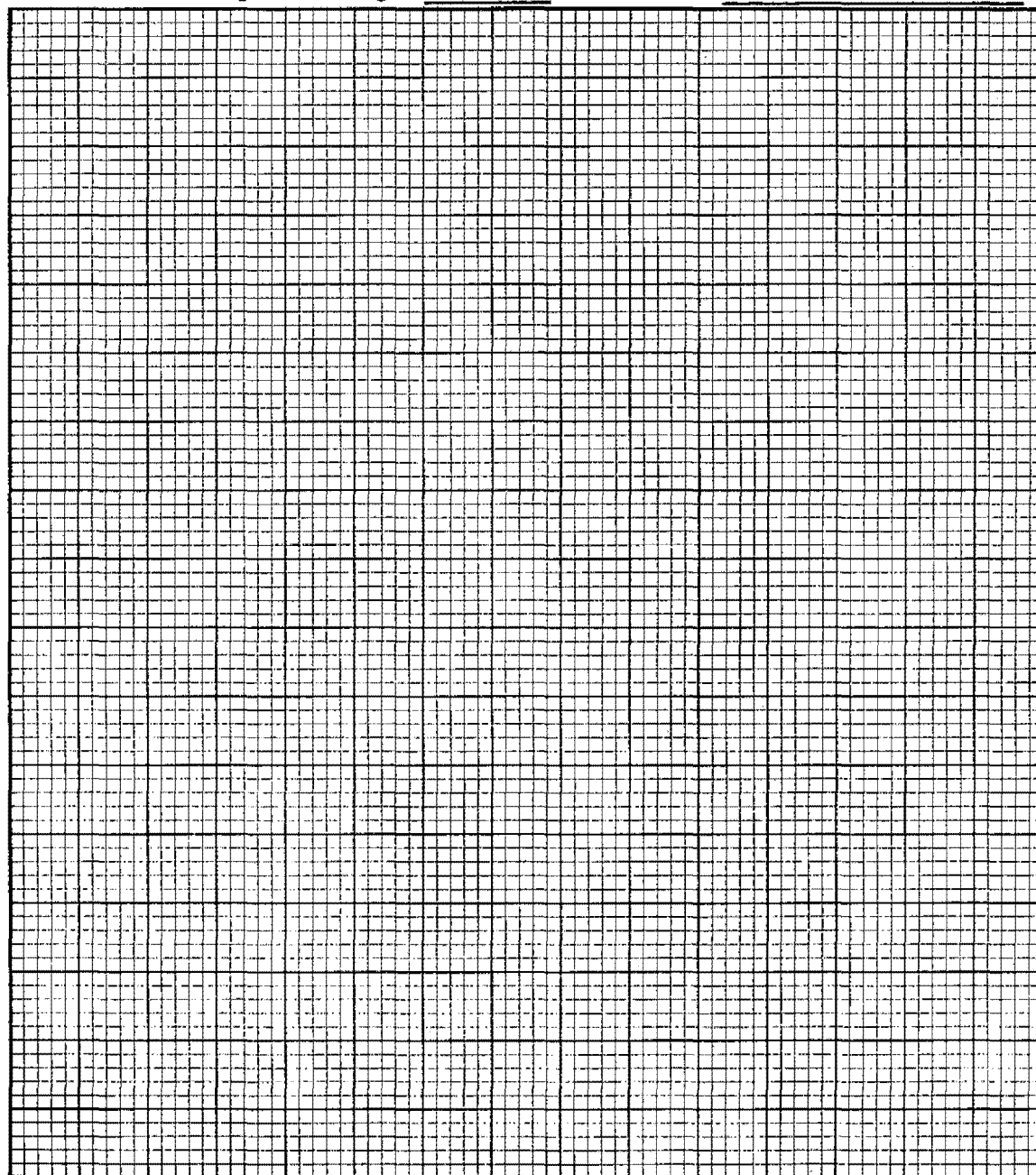
Weight _____ lbs.

Wing Flap Position _____

Cowl Flap Position _____

Critical Inoperative Engine _____

Power _____



BEST RATE OF CLIMB
(ft/min)

BEST R/C SPEED
M.P.H. C.A.S.

SECTION IV. PERFORMANCE:

E. Climbs: (continued)

3.85(c) 4. Balked Landing Climb

3.85a(c)

a. Is landing gear extended?..... Yes No

b. Are wing flaps in the landing position?..... NA Yes No

(1) If "yes", what is extension in degrees? _____

3.85-3

(2) If "no", may retraction of the wing flaps be made in 2 seconds or less, with safety, without loss of altitude and without requiring sudden changes of angles of attack or exceptional skill on the part of a private pilot?..... Yes No

c. Is takeoff power used on all engines?..... Yes No

3.85-4

d. Is maximum landing weight used?..... Yes No

e. Cowl flap setting _____ (should be position normally used for takeoff)

f. Weight _____ lbs;

C.G. _____ % MAC; Ref.: Page _____ Appendix _____

g. Results (from chart on next page)

3.85(c)

h. For airplanes or more than 6000 lbs. T.O. weight: NA

(1) Is steady angle of climb (at sea level) greater than 1:30?..... Yes No

(2) What is actual angle of climb ratio? _____

3.85a(c)

i. For airplanes of 6000 lbs. or less: NA

(1) Is steady rate of climb at sea level at least 5 V_{so} or 200 feet per minute, whichever is greater? (5 V_{so} _____) Yes No

(2) What is actual rate of climb? _____

SECTION IV. PERFORMANCE:

E. Climbs:

4. Balked Landing Climb: (continued)

	Time	Pressure Altitude (Feet)		O.A.T. °F	C.A.T. °F	I.A.S. M.P.H.	Engine R.P.M.	M.P. in. Hg.	Weight
		Ea. Min.	Ea. 1/2 Min.						
Climb #1									
Climb #2									
Climb #3									
Climb #4									
Climb #5									
HS *									

* Record high speed run in level flight at intermediate altitude
(Use additional data sheets in appendix when required)

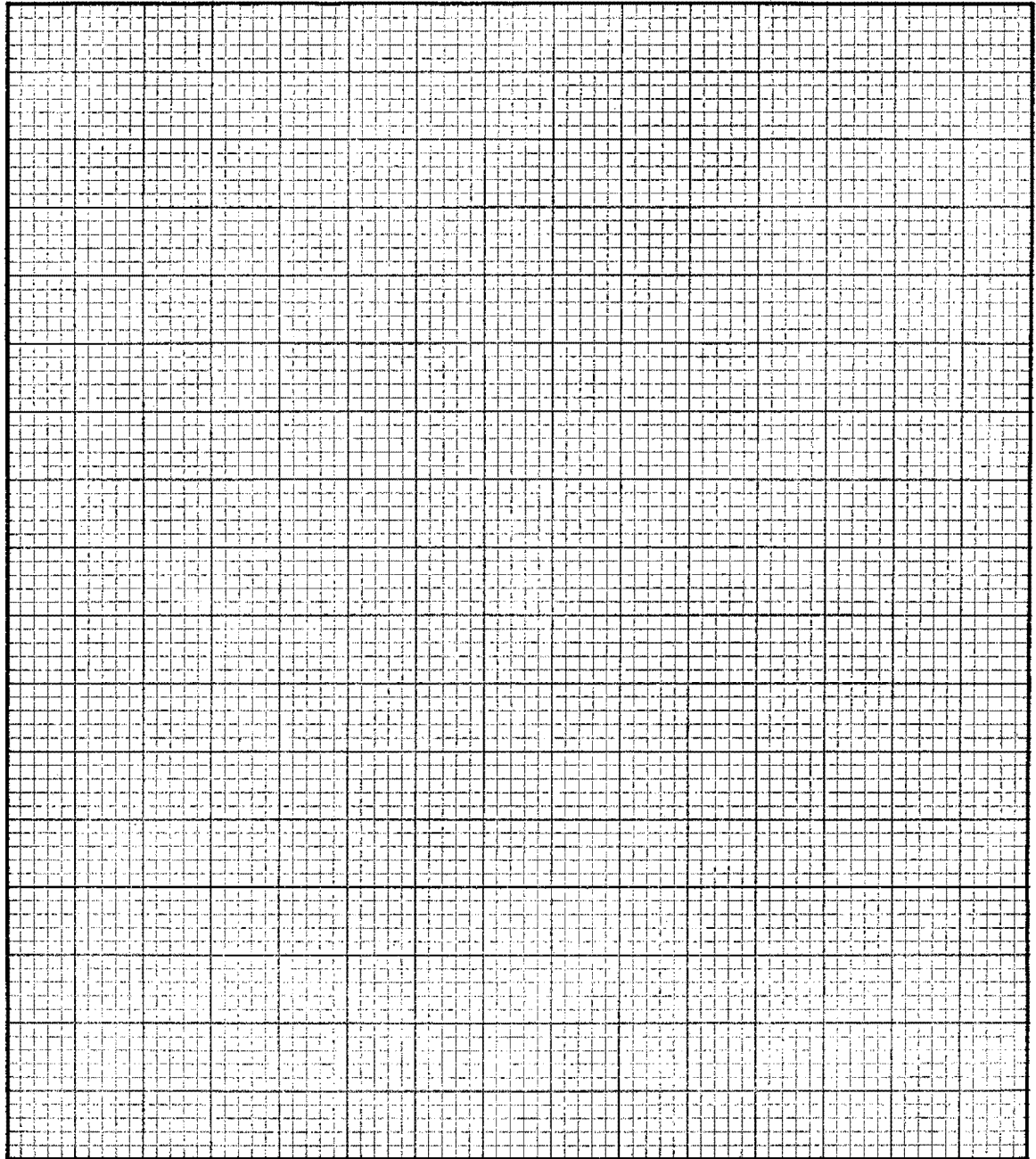
V max. _____ I.A.S. _____ C.A.S.

V min. _____ I.A.S. _____ C.A.S.

CURVES FOR DETERMINING THE BEST RATE OF CLIMB AND SPEED
BALKED LANDING CLIMB

3.85(c) Landing Gear Position _____ Weight _____ lbs.
 3.85a(c) Wing Flap Position _____ Cowl Flap Position _____
 Power _____

CORRECTED RATE OF CLIMB (ft/min)

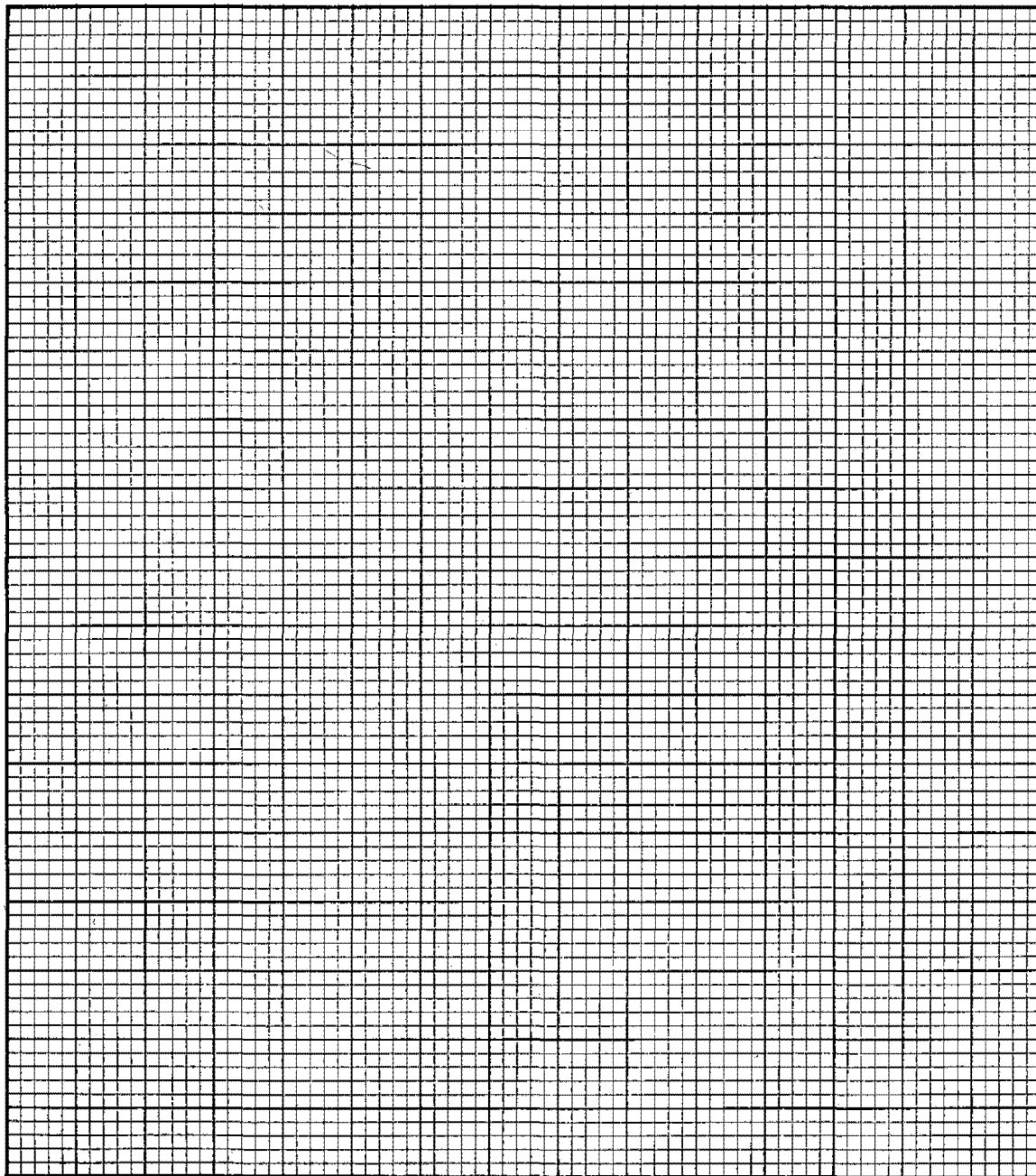


CALIBRATED AIRSPEED (M.P.H.)

CLIMB PERFORMANCE - BALKED LANDING CLIMB

3.85(c) Landing Gear Position _____ Weight _____ lbs.
3.85a(c) Wing Flap Position _____ Cowl Flap Position _____
Power _____

DENSITY ALTITUDE (feet)



BEST RATE OF CLIMB
(ft/min)

BEST R/C SPEED
M.P.H. C.A.S.

SECTION IV. PERFORMANCE:

E. Climbs: (continued)

5. Takeoff Climb

3.85a(a) a. Is climb test conducted with gear extended?..... Yes No

b. Are wing flaps in takeoff position?..... NA Yes No

(1) If "yes", what is flap position? _____ degrees

c. Weight _____ lbs. (Max. takeoff weight)

Critical C.G. _____ % MAC (Most forward generally
critical)

d. Are engine(s) operated within approved limitations?..... Yes No

(Use takeoff power if practicable)

e. Cowl flap setting _____ (same as used for cooling tests)

f. Results (from chart on next page)

3.85a(a) g. Does airplane have a maximum certificated takeoff weight of
6000 lbs. or less?..... Yes No

(1) If "yes", is steady rate of climb at sea level 10 V_{s1} or
300 feet per minute, whichever is greater?..... Yes No

(2) What is actual rate of climb? _____ Ft. /Min.

SECTION IV. PERFORMANCE:

E. Climbs:

5. Takeoff Climb: (continued)

	Time	Pressure Altitude (Feet)		O.A.T. °F	C.A.T. °F	I.A.S. M.P.H. **	Engine R.P.M.	M.P. in. Hg.	Weight
		Ea. Min.	Ea. 1/2 Min.						
Climb #1									
Climb #2									
Climb #3									
Climb #4									
Climb #5									
HS *									

* Record high speed run in level flight at intermediate altitude

** Speeds should bracket 1.3 V_{s1}

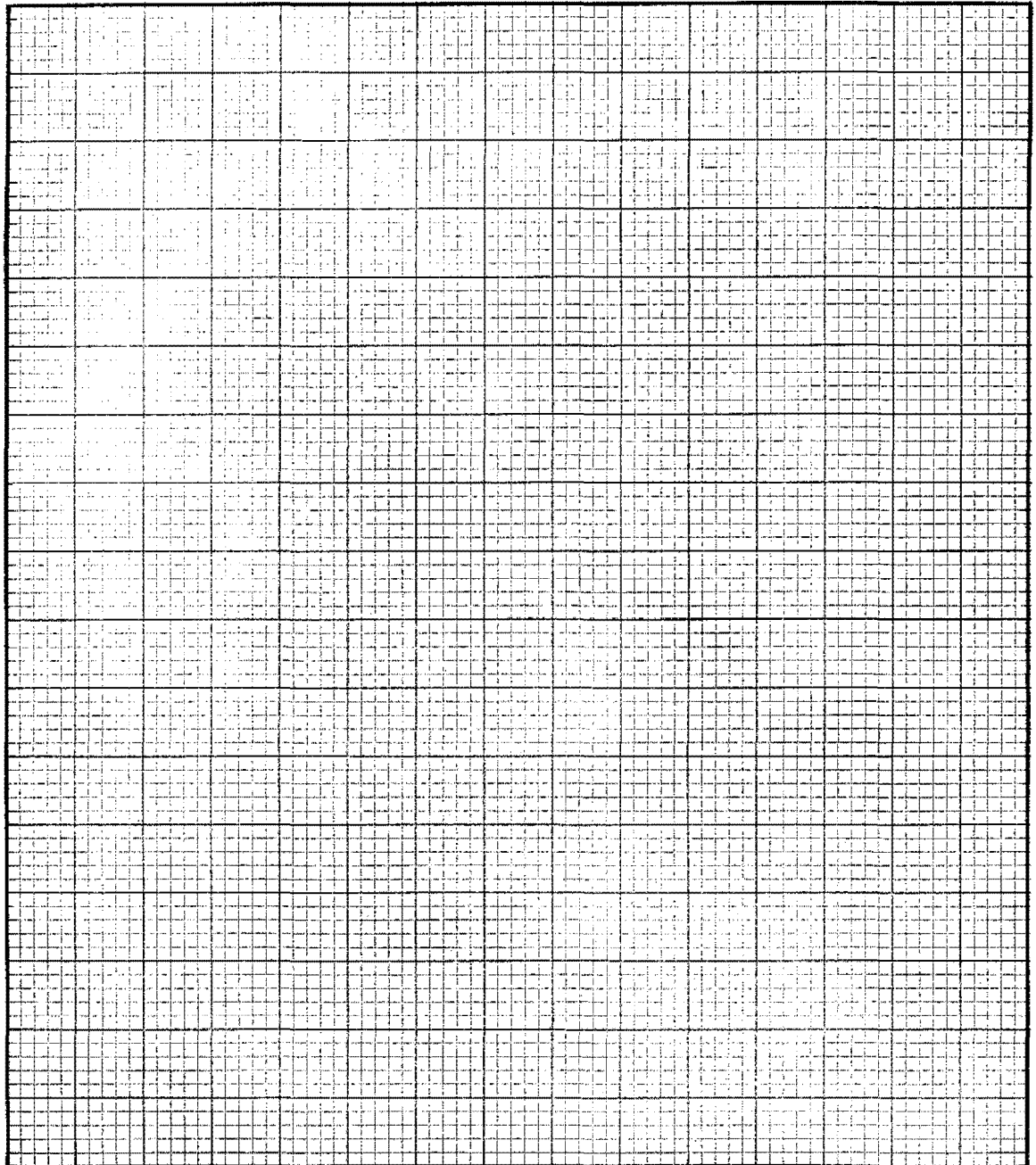
V max. _____ I.A.S. _____ C.A.S.

V min. _____ I.A.S. _____ C.A.S.

CURVES FOR DETERMINING THE BEST RATE OF CLIMB AND SPEED
TAKEOFF CLIMB

3.84 Landing Gear Position _____ Weight _____ lbs.
3.85a(a) Wing Flap Position _____ Cowl Flap Position _____
Power _____

CORRECTED RATE OF CLIMB (ft/min)



CALIBRATED AIRSPEED (M.P.H.)

CLIMB PERFORMANCE - TAKEOFF CLIMB

.84

.85a(a)

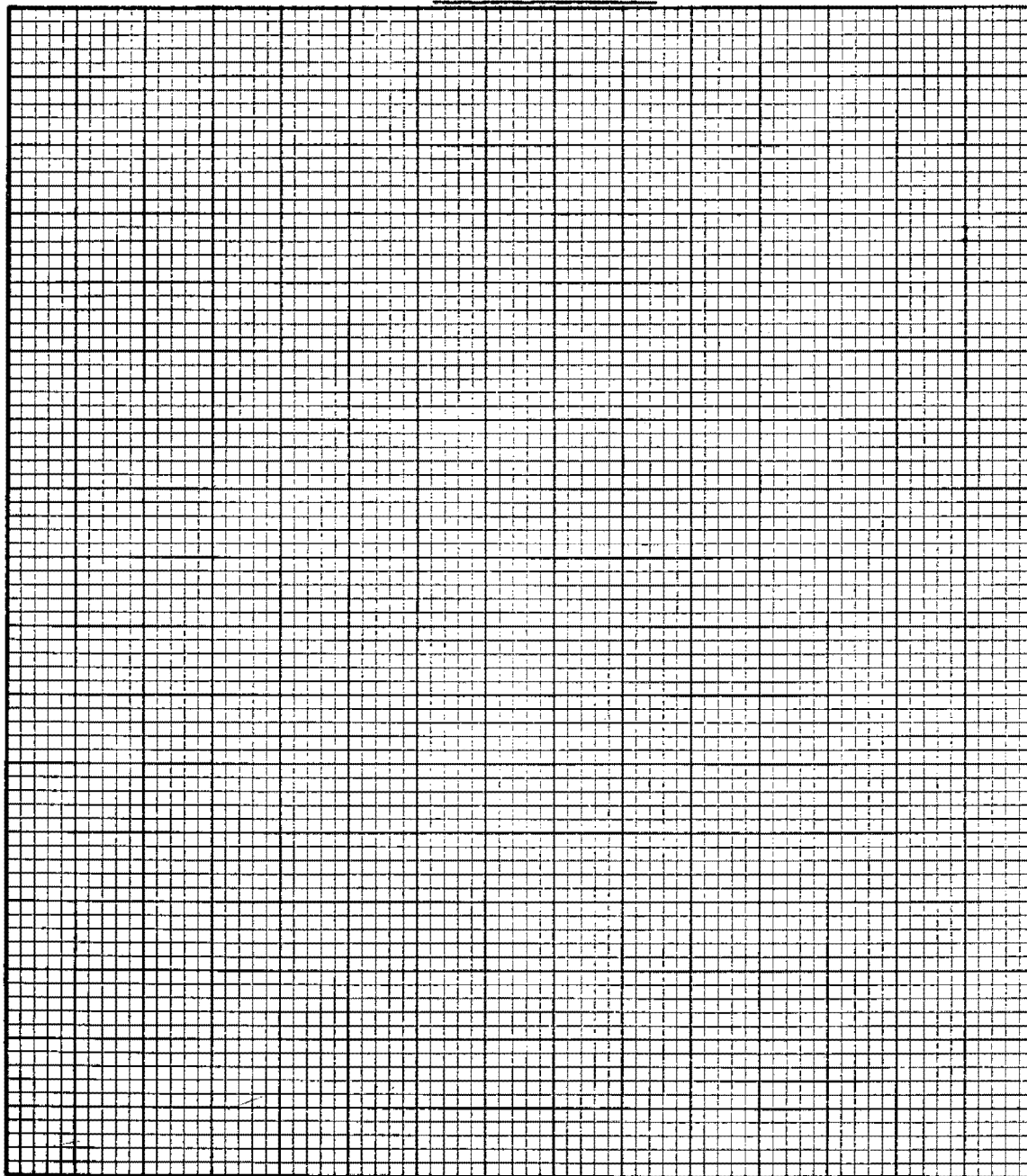
Landing Gear Position _____

Weight _____ lbs.

Wing Flap Position _____

Cowl Flap Position _____

Power _____



BEST RATE OF CLIMB
(ft/min)

BEST R/C SPEED
M.P.H. C.A.S.

SECTION IV. PERFORMANCE: (continued)

F. Takeoff

1. Piece Method (Distance to takeoff and climb over a 50 ft. obstacle by piece method applicable to airplanes having a maximum certificated takeoff weight greater than 6000 lbs.)

a. Ground Run

- | | | | |
|--------|--|-----|------------|
| 3.84 | (1) Were deicers installed? (If "yes" (See II.E.2.))..... | Yes | No |
| 3.84-1 | (2) Weight _____ lbs.; C.G. _____ % MAC | | |
| 3.84-2 | (Most unfavorable combination of Weight and C.G. location); (Most forward generally critical, unless inspector believes otherwise); Ref.: Page _____ Appendix _____. | | |
| | (3) Propeller: (See II.C.2.)
(Should be the one having both the smallest diameter and lowest static R.P.M. for recommendation in the aircraft specification) | | |
| | (4) Mixture setting _____ (should be position normally used for take-off) | | |
| | (5) Cowl flap setting _____ (should be position normally used for take-off) | | |
| | (6) Are engines operating within approved limitations?.....
(T.O. power to be used if available) | Yes | <u>No</u> |
| | R.P.M. _____ . Manifold Pressure _____ in.Hg. | | |
| | (7) Is wing flap in takeoff position?..... | Yes | <u>No</u> |
| | (8) Is gear retraction started prior to attaining speed of 1.3 V _{s1} ?..... | Yes | No |
| | (If "yes", is retraction begun earlier than in normal takeoffs?)..... | No | <u>Yes</u> |
| | (9) Is gear retraction completed prior to attainment of 1.3 V _{s1} ?..... | Yes | No |

SECTION IV. PERFORMANCE:

F. Takeoff:

1. Piece Method:

a. Ground Run: (continued)

(10) Surface conditions at the takeoff area

(a) Land

(i) Paved (ii) Hard Turf (iii) Long Grass (iv) Cinder (v) Wet

(b) Water

Height of waves (trough to crest) _____ inches

(11) Data for ground takeoff (photographic equipment to be used)

At Least 3 Runs At Or Bracketing 1.3 Vsl	1st Run	2nd Run	3rd Run
(a) Engine R.P.M.			
(b) Manifold Pressure (in.Hg.)			
(c) Carburetor Air Temperature (°F)			
(d) Outside Air Temperature (°F)			
(e) Pressure Altitude (Set 29.92) (Ft.)			
(f) Density Altitude (Ft.)			
(g) Wind Velocity At _____ Ft. Above Surface (M.P.H.)			
(h) Wind Direction With Respect To Runway (0° = Head Wind, 180° = Tail Wind)			
(i) Wind Component Along Runway (M.P.H.)			
(j) Wind Component Across Runway (M.P.H.)			
(k) Indicated Air Speed At T.O. (M.P.H.)			
(l) C.A.S. At Takeoff (M.P.H.)			
(m) Actual Weight (Lbs.)			
(n) Measured Ground Run To Accelerate To Speed Of 1.3 Vsl (Ft.)			
(o) Corrected Ground Run (St. Cond.) (Ft.)			
(p) Ave. Corrected Ground Run (Ft.)			

NOTE: Standard starting point for seaplanes may be assumed to be at point at which 3 m.p.h. is attained.

3.84(c) (12) Are above T.O. runs made in such a manner that their reproduction shall not require an exceptional degree of skill or exceptionally favorable condition?..... Yes No

SECTION IV. PERFORMANCE:

F. Takeoff:

1. Piece Method: (continued)

b. Air Run What is distance to gain height of 50 feet? _____
Ft. (Obtain from IV,E,5)

(1) Is this obtained at speed not less than $1.3 V_{s1}$?..... Yes No

What speed? _____ M.P.H. - C.A.S.

(2) If "no", is a speed of at least V_x plus 5 used?..... Yes No

(a) What speed? _____ M.P.H. - C.A.S.

(b) Is airplane at this speed demonstrated to be safe
under all conditions including turbulence and complete
engine failure?..... Yes No

(If multiengine, must be at least V_{mc}).

c. Total Run (Corrected to standard and sea level conditions)

(1) What is total run distance to takeoff and gain 50 feet at
sea level standard conditions? _____ Ft.

(2) Are data for inclusion in the operating limitations
submitted to indicate the variations in the total run for
a change in altitude from S.L. to 7000 feet and in
temperature from 0° to 100°F ?..... Yes No

Is this graph also attached to this TIR?..... Yes No

2. Continuous Method (Distance to takeoff and climb over a 50 ft.
obstacle by continuous run method). (Applicable to airplanes which
have a maximum certificated takeoff weight greater than 6000 lbs.)

3.84 a. Were deicers installed? (If "yes" (See II,E,2)..... Yes No

3.84-1

b. Weight _____ lbs; C.G. _____ % MAC (Most
unfavorable combination of weight and C.G. location) (Most
forward generally critical, unless inspector believed other-
wise)

c. Propeller (See II,C,2)
(Should be the one having both the smallest diameter and
lowest static r.p.m. for recommendation in the aircraft
specification)

F. Takeoff:

.84 d. Mixture setting_____ (should be position normally
.84-1 used for takeoff)

.84-2

e. Cowl flap setting _____ (should be position normally used for takeoff)

f. Are engine(s) operating within approved limitations?..... Yes No
(T.O. power to be used if available)

R.P.M.	Manifold Pressure	in. Hg.
1000	10.0	10.0
1200	12.0	12.0
1400	14.0	14.0
1600	16.0	16.0
1800	18.0	18.0
2000	20.0	20.0
2200	22.0	22.0
2400	24.0	24.0
2600	26.0	26.0
2800	28.0	28.0
3000	30.0	30.0
3200	32.0	32.0
3400	34.0	34.0
3600	36.0	36.0
3800	38.0	38.0
4000	40.0	40.0
4200	42.0	42.0
4400	44.0	44.0
4600	46.0	46.0
4800	48.0	48.0
5000	50.0	50.0
5200	52.0	52.0
5400	54.0	54.0
5600	56.0	56.0
5800	58.0	58.0
6000	60.0	60.0
6200	62.0	62.0
6400	64.0	64.0
6600	66.0	66.0
6800	68.0	68.0
7000	70.0	70.0
7200	72.0	72.0
7400	74.0	74.0
7600	76.0	76.0
7800	78.0	78.0
8000	80.0	80.0
8200	82.0	82.0
8400	84.0	84.0
8600	86.0	86.0
8800	88.0	88.0
9000	90.0	90.0
9200	92.0	92.0
9400	94.0	94.0
9600	96.0	96.0
9800	98.0	98.0
10000	100.0	100.0

g. What is wing flap position? _____ Degrees
(T.O. Flap)

h. At the takeoff area

(1) Surface Conditions - Land

(a) Paved (b) Hard Turf (c) Long Grass (d) Cinder (e) Wet

(2) Surface Conditions - Water

(a) Height of waves (Trough to crest) _____ inches

SECTION IV. PERFORMANCE:

F. Takeoff:

2. Continuous Method: (continued)

i. Data for ground takeoff and climb to 50 ft. (Photographic equipment to be used)

At Least 3 Runs At Or Bracketing 1.3 V_{sl} At 50 Ft. Level *	1st Run	2nd Run	3rd Run
(1) Engine R.P.M.			
(2) Manifold Pressure (in. Hg.)			
(3) Carburetor Air Temperature ($^{\circ}$ F)			
(4) Outside Air Temperature ($^{\circ}$ F)			
(5) Pressure Altitude (Set at 29.92) (Ft.)			
(6) Density Altitude (Ft.)			
(7) Wind Velocity at _____ Ft. Above Surface (M.P.H.)			
(8) Wind Direction With Respect to Runway (0° Head Wind, 180° Tail Wind)			
(9) Wind Component Along Runway (M.P.H.)			
(10) Wind Component Across Runway (M.P.H.)			
(11) I.A.S. at T.O. (M.P.H.)			
(12) C.A.S. at Takeoff (M.P.H.)			
(13) Actual Weight (Lbs.)			
(14) Measured Ground Run (Ft.)			
(15) Corrected Ground Run (S.L.Std.Cond.) (Ft.)			
(16) Measured Air Run to 50 Ft. (Ft.)			
(17) I.A.S. at 50 Ft. (M.P.H.)			
(18) C.A.S. at 50 Ft. (M.P.H.)			
(19) Corrected Air Run at 50 Ft. at 1.3 V_{sl} , Standard Conditions (Ft.)			
(20) Total Corrected Run (Ft.)			
(21) Average Corrected Run (Ft.)			

* Speed at 50 ft. level may be used which is not less than V_x plus 5 m.p.h.

NOTE: Starting point for seaplanes may be assumed to be at point at which 3 m.p.h. attained.

j. Is speed of V_x plus 5 m.p.h. or greater at 50 ft. used?..... No Yes

(1) If "yes", insert appropriate values in table above.

(2) Is airplane demonstrated at speed used (Must be greater than V_{mc}) to be safe under all conditions including turbulence and complete engine failure?..... Yes No

SECTION IV. PERFORMANCE:

F. Takeoff:

2. Continuous Method: (continued)

k. Are above runs made in such a manner that their reproduction shall not require an exceptional degree of skill or exceptionally favorable condition?..... Yes No

l. Are data for inclusion in the operating limitations submitted to indicate the variations in the total run for a change in altitude from S.L. to 7000 ft. and in temperature from 0°F to 100°F?..... Yes No

Is this graph also attached to this TIR?..... Yes No

G. Landing (Distance to a complete stop from a height of 50 ft.)*

1. Airplanes with maximum certificated weight greater than 6000 lbs.

a. General Data

3.86(a) (1) Were deicers installed? (If "yes", (See II.E.2)..... Yes No

(2) Is maximum T.O. weight used?..... Yes No

(3) Weight_____lbs.; C.G._____ % MAC (Most unfavorable combination of Weight and C.G. position) Ref.: Page_____ Appendix_____ (Most forward generally critical, unless inspector believes otherwise)

(4) Cowl flap setting_____ (should be set for landing)

(5) Are engines throttled, propellers in low pitch?..... Yes No

(6) Is wing flap in landing position?..... Yes No

What is flap position? _____ degrees

(7) Is landing gear extended?..... Yes No

(8) Surface conditions at the landing area

(a) Land

(i) Paved (ii) Hard Turf (iii) Long Grass (iv) Cinder

(v) Wet

(b) Water

Height of waves (Trough to crest) _____ inches

SECTION IV. PERFORMANCE:

G. Landing:

1. Airplanes with maximum certificated weight greater than 6000 lbs.
(continued)

b. Landing Data (Photographic equipment to be used)

(1) Observed and Corrected Test Data

At Least 3 Runs At Or Above 1.3 V_{so} , C.A.S. In Steady Glide Approach Before Reaching 50 Ft.	1st Run	2nd Run	3rd Run
(a) Outside Air Temperature (°F)			
(b) Pressure Altitude (Set at 29.92) (Ft.)			
(c) Density Altitude (Ft.)			
(d) Wind Velocity At _____ Ft. Above Surface (M.P.H.)			
(e) Wind Direction With Respect To Runway (0°-Head Wind, 180°-Tail Wind)			
(f) Wind Component Along Runway (M.P.H.)			
(g) Wind Component Across Runway During Approach Glide at 50 Ft. Altitude (M.P.H.)			
(h) Engine R.P.M.			
(i) Manifold Pressure (in.Hg.)			
(j) I.A.S. (M.P.H.)			
(k) C.A.S. (Should be at or above 1.3 V_{so} (M.P.H.)			
(l) Is airplane trimmed? (Yes or No) At Contact			
(m) I.A.S. (M.P.H.)			
(n) C.A.S. (M.P.H.)			
(o) Altitude of Airplane			
(p) Actual Weight (Lbs.)			
<u>Landing Distance</u>			
*(q) Measured Distance From 50 Ft. to Stop (Ft.)			
(r) Corrected Distance (Std.Cond.& S.L.) (Ft.)			
(s) Average Corrected Landing Distance (ft.)			

- * (Complete stop for seaplanes, amphibian, etc. may be interpreted at a speed of 3 m.p.h.)

SECTION IV. PERFORMANCE:

G. Landing:

1. Airplanes with maximum certificated weight greater than 6000 lbs. (continued)

c. Landing Test Results

(1) Are above landing runs made in such a manner that their reproduction shall not require an exceptional degree of skill or exceptionally favorable conditions?..... Yes No

(2) Are landings made such that there was no excessive vertical acceleration, tendency to bounce, nose over, ground loop, porpoise or water loop?..... Yes No

(3) Is landing gear arrangement nosewheel or tailwheel? _____

(a) Were above landings made in level on tail down altitude? _____

(b) If nosewheel, and landings were made in level altitude, can flared landings be made tail down with most forward c.g.?..... NA Yes No

(c) If tailwheel, and landings were made in level altitude, can landing be made tail down at most forward c.g.?..... NA Yes No

(4) Are data for inclusion in the AFM submitted to indicate the variations in the landing run for a change in altitude from S.L. to 7000 ft. and in temperature from 0°F to 100°F?..... Yes No

Are these data also attached to this TIR?..... Yes No

.86-1 (5) Were landing distances established with use of reversible thrust propellers?..... NA No Yes

2. Landing Tests - Applicable to Airplanes Having A Maximum Certificated Weight Of 6000 Lbs. Or Less.

.87 Was it demonstrated that the airplane can be safely landed and brought to a stop without requiring an exceptional degree of piloting skill (by private pilot), and without excessive vertical acceleration tendency to bounce, nose over, groundloop, porpoise or water loop?..... Yes No

SECTION V. HANDLING QUALITIES

A. Ground Handling

To be determined at most adverse authorized Weight and C.G. position for each test conducted:

- | | | | |
|-------|--|-----|------------|
| 3.145 | 1. Is there any unusual ground looping tendency?..... | No | <u>Yes</u> |
| | Is this demonstrated during power-off landings at normal landing speed during which brakes or engine power are not used to maintain a straight path?..... | Yes | <u>No</u> |
| 3.145 | 2. Is directional control during taxiing and takeoff satisfactory? | Yes | <u>No</u> |
| 3.145 | 3. Is there any uncontrollable looping tendency during taxiing, takeoff, or landing in 90° crosswinds up to a wind intensity of 0.2 V _{so} _____ M.P.H.?..... | No | <u>Yes</u> |
| | a. Is airplane tested in 90° crosswind greater than 0.2 V _{so} ?.. | Yes | No |
| | (1) If "yes", what is this wind value _____ M.P.H. | | |
| | (2) Are characteristics satisfactory at this value?..... | Yes | No |
| | (3) Is this the highest 90° crosswind intensity which is recommended for this airplane?..... | Yes | No |
| 3.144 | 4. Is there any uncontrollable tendency to nose over in any operating condition reasonably expected for the type, including rebound during landing or takeoff?..... | No | <u>Yes</u> |
| 3.144 | 5. Do wheel brakes operate smoothly and exhibit no undue tendency to induce nosing over?..... | Yes | <u>No</u> |
| 3.146 | 6. Does shock absorbing mechanism appear to be adequate to prevent damage to any part of the airplane when operated on the roughest ground which may reasonably be expected in normal operation (specify type of surface used for test)..... | Yes | <u>No</u> |
| _____ | | | |
| _____ | | | |
| _____ | | | |
| 3.351 | 7. Is shock absorbing mechanism, under the above conditions, such that "bottoming" or other possible damage to structure will not occur?..... | Yes | <u>No</u> |

SECTION V. HANDLING QUALITIES: (continued)

B. Water Handling

To be determined at maximum takeoff weight and with most unfavorable authorized C.G. position for each test conducted:

- 3.147 1. Does the spray during taxiing, takeoff and landing at any time:
- a. dangerously obscure the vision of the pilots?..... No Yes
- b. produce damage to the propeller or other parts of the airplane?..... No Yes
- 3.144 2. Is there any dangerous or uncontrollable porpoising at any speed or condition at which the airplane is normally operated? No Yes
- 3.145(c) 3. Can airplane be held on a straight course during takeoff run with takeoff power on all engines?..... Yes No
- 3.106 4. Can airplane be safely controlled in the event of failure of any engine at any point in the takeoff run and in taxiing?... Yes No
- 3.145 5. Can airplane be maneuvered and sailed safely under all expected conditions?..... Yes No
- 3.145 6. If water rudders are provided, do they perform satisfactorily?..... NA Yes No
- 3.335
- 3.145 7. Is airplane satisfactorily controllable during taxiing, takeoff, or landing in 90° crosswinds up to a wind intensity of 0.2 V_{so} _____ M.P.H.?..... Yes No
- a. Is airplane tested in 90° crosswind greater than 0.2 V_{so} ? Yes No
- If "yes", answer the following:
- (1) What is this wind value _____ M.P.H.
- (2) Are characteristics satisfactory at this value?.... Yes No
- (3) Is this the highest 90° crosswind intensity which is recommended for this airplane?..... Yes No
- b. Estimate maximum wind velocity in which satisfactory 360° turns can be executed at or below hump speed _____ M.P.H.
- c. Estimate the wave height (trough to crest) of the roughest water upon which the airplane has been operated _____ inches.

SECTION V. HANDLING QUALITIES: (continued)

C. Ski Handling

To be determined at the most adverse authorized Weights and C.G. positions for each test condition:

- | | | | |
|---------|--|-----|------------|
| 3.144 | 1. Are takeoff characteristics satisfactory?..... | Yes | <u>No</u> |
| 3.145 | | | |
| 3.144 | 2. Are landing characteristics satisfactory?..... | Yes | <u>No</u> |
| 3.145 | | | |
| 3.144 | 3. Can airplane be satisfactorily maneuvered on the ground?..... | Yes | <u>No</u> |
| 3.145 | | | |
| 3.106 | 4. Are the airplane's flight characteristics satisfactory with the | | |
| 3.780-3 | skis installed?..... | Yes | <u>No</u> |
| 3.335 | 5. Are brakes provided?..... | Yes | No |
| | (If "yes", are these considered satisfactory?)..... | Yes | <u>No</u> |
| 3.145 | 6. Is there any uncontrollable looping tendency during taxiing, | | |
| | takeoff, or landing in 90° crosswinds up to a wind intensity | | |
| | of 0.2 V_{so} _____ M.P.H.?..... | No | <u>Yes</u> |
| | a. Is airplane tested in 90° crosswind greater than 0.2 V_{so} ?.. | Yes | No |
| | (1) If "yes", what is this wind value _____ M.P.H. | | |
| | (2) Are characteristics satisfactory at this value?..... | Yes | No |
| | (3) Is this the highest 90° crosswind intensity which is | | |
| | recommended for this airplane?..... | Yes | No |

.84(a),(b)	a. Is takeoff power used?.....	Yes	<u>No</u>
	b. Is loading at most unfavorable weight?.....	Yes	<u>No</u>
	c. Is loading at most unfavorable C.G.?.....	Yes	<u>No</u>
	d. Is exceptional piloting skill required to make safe take-off?.....	No	<u>Yes</u>
	e. Airplane is of tailwheel type or nosewheel type (Circle which)		
	(1) If tailwheel type, is elevator control at 0.8V _{s1} sufficient to hold airplane on runway until a safe takeoff speed is attained?.....	Yes	<u>No</u>
	(2) If nosewheel type, is elevator control at 0.85 V _{s1} sufficient to raise nosewheel clear of takeoff surface? Yes	No	No

REMARKS

[illegible]

SECTION V. HANDLING QUALITIES: (continued)

E. Flight Characteristics (If flight characteristics are affected by altitude they should be investigated at the most adverse normally expected operating altitude.)

1. Most Forward C.G. Condition at Maximum T.O. Weight

a. Weight _____ lbs.; C.G. _____ % MAC; Ref.: Page _____
Appendix _____

b. Propeller (See II.C.2.)

c. Were deicers installed? (If "yes" (See II.E.2))..... Yes No
3.112(a)(2)

d. Tests for Trim

Configuration	Observed Data	Trim Speed	Longitudinal Trim
(1) <u>Climbs - M.C. Power</u> M.C. Power () Gear Retracted () Flap Retracted ()	Hp _____ Ft. R.P.M. _____ M.P. _____ in.Hg. O.A.T. _____ °F	Speed between V _x & 1.4V _{s1} ____ MPH - IAS ____ MPH - CAS Trim Tab Indicator Position _____	Trimmed <u>Tail Heavy</u> <u>Nose Heavy</u>
(2) <u>Climb - M.C. Power</u> M.C. Power () Gear Retracted () Takeoff Flaps _____ °	Hp _____ Ft. R.P.M. _____ M.P. _____ O.A.T. _____ °F	Speed between V _x & 1.4V _{s1} ____ MPH - IAS ____ MPH - CAS Trim Tab Indicator Position _____	Trimmed <u>Tail Heavy</u> <u>Nose Heavy</u>
(3) <u>Power Approach **</u> Power to maintain 3° angle of descent. Gear Extended () Flap Retracted ()	Hp _____ Ft. R.P.M. _____ M.P. _____ in.Hg. O.A.T. _____ °F	1.5V _{s1} _____ MPH - IAS ____ MPH - CAS Trim Tab Indicator Position _____ Minimum Trim Speed ____ MPH - IAS ____ MPH - CAS	Trimmed <u>Tail Heavy</u> <u>Nose Heavy</u>
Gear Extended () Flap Extended ()	Hp _____ Ft. R.P.M. _____ M.P. _____ in.Hg. O.A.T. _____ °F	1.5V _{s1} _____ MPH - IAS ____ MPH - IAS Trim Tab Indicator Position _____ Minimum Trim Speed ____ MPH - IAS ____ MPH - CAS	Trimmed <u>Tail Heavy</u> <u>Nose Heavy</u>
Gear Extended () Flap Extended () Fwd. C.G. regardless of weight	Hp _____ Ft. R.P.M. _____ M.P. _____ in.Hg. O.A.T. _____ °F	1.5V _{s1} _____ MPH - IAS ____ MPH - CAS Trim Tab Indicator Position _____ Minimum Trim Speed ____ MPH - IAS ____ MPH - CAS	Trimmed <u>Tail Heavy</u> <u>Nose Heavy</u>

** Item VELD(3) to be conducted also at forward c.g regardless of weight.

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

1. Most Forward C.G. Condition at Maximum T.O. Weight:

e. Test for Static Longitudinal Stability:

3.115(a) 3.114(b)	In configuration of item VEld(3), conduct the static longitudinal stability test with trim at 1.5V _{s1}	Ref. Data Sheet # _____ Stable slope required between 1.1 V _{s1} and 1.8V _{s1} , Stick force must not exceed 40 pounds between those speed limits. Free return speed (friction band) Must be within $\pm 10\%$ (+ _____ M.P.H. - I.A.S) (- _____ M.P.H. - I.A.S) (+ _____ % V trim) (- _____ % V trim) Stable () <u>Unstable</u> ()
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SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

1. Most Forward C.G. Condition - At Maximum T.O. Weight: (continued)

3.109(b) f. Special Longitudinal Control Tests:

Configuration (gear extended each case)	Information		Does it require a change in the trim control or the exertion of more control force than can be readily applied with one hand for a short period to	Force + Push* - Pull*
	Observed Data	Trim Speed 1.5V _{s1} or Min Trim Speed		
(1) <u>Glide</u> Throttle Closed () Gear Extended () Flaps Retracted ()	HP _____ Ft. OAT _____ °F RPM _____ In.Hg. _____	____ MPH-IAS ____ MPH-CAS	extend the flaps as rapidly as possible to landing position _____ ° while maintaining approx. 1.4 x instantaneous stall speed? No <u>Yes</u>	
(2) <u>Glide</u> Throttle Closed () Gear Extended () Landing Flaps _____ °	HP _____ Ft. OAT _____ °F RPM _____ In.Hg. _____	____ MPH-IAS ____ MPH-CAS	retract the flaps as rapidly as possible, while maintaining app approx. 1.4 x instantaneous stall speed? No <u>Yes</u>	
(3) <u>Climb</u> M.C. Power () Gear Extended () Landing Flaps _____ °	HP _____ Ft. OAT _____ °F RPM _____ In.Hg. _____	____ MPH-IAS ____ MPH-CAS	retract the flaps as rapidly as possible, while maintaining approx. 1.4 x instantaneous stall speed? No <u>Yes</u>	
(4) <u>Glide</u> Throttle Closed () Gear Extended () Flaps Retracted ()	HP _____ Ft. OAT _____ °F RPM _____ In.Hg. _____	____ MPH-IAS ____ MPH-CAS	Apply T.O. power quickly while maintaining the same speed? No <u>Yes</u>	
(5) <u>Glide</u> Throttle Closed () Gear Extended () Landing Flaps _____ °	HP _____ Ft. OAT _____ °F RPM _____ In.Hg. _____	____ MPH-IAS ____ MPH-CAS	Apply T.O. power quickly while maintaining the same speed? No <u>Yes</u>	
(6) <u>Glide</u> Throttle Closed () Gear Extended () Landing Flaps ()	HP _____ Ft. OAT _____ °F RPM _____ In.Hg. _____	____ MPH-IAS ____ MPH-CAS	Obtain and maintain speed at 1.1V _{s1} ? (_____ MPH - IAS _____ MPH - CAS) No <u>Yes</u>	
(7) <u>Glide</u> Throttle Closed () Gear Extended () Landing Flaps _____ °	HP _____ Ft. OAT _____ °F RPM _____ In.Hg. _____	____ MPH-IAS ____ MPH-CAS	obtain and maintain speed at the lower of 1.7V _{s1} or V _f ? (_____ MPH - IAS _____ MPH - CAS) No <u>Yes</u>	

* Use + or - to indicate a push or pull force

E. Flight Characteristics:

E. Flight Characteristics:

f. Special Longitudinal Control Tests (continued)

and with the most forward center of gravity position
approved regardless of weight?..... Yes No

3.109(e) (9) Is it possible, without the use of the primary means of longitudinal control, to control the descent of the airplane with the use of all other normal flight and power controls to a zero rate of descent and to an attitude suitable for a controlled landing without requiring exceptional strength skill or alertness on the part of the pilot, or without exceeding the operational and the structural limitations of the airplane?..... Yes No

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

1. Most Forward C.G. Condition at Maximum T.O. Weight: (continued)

3.109(c)	g.	Controllability test for flap retraction with simultaneous application of M.C. power at speed of 1.1 V_{S1}		
		Configuration	Information	Result
		Steady level flight, power sufficient for speed of 1.1 V_{S1} ()	Hp _____ Ft. Power _____ R.P.M. _____ Before Test In.Hg. _____	Is exceptional piloting skill (for a private pilot) required to maintain essentially level flight? No <u>Yes</u>
		Gear Extended ()	Power _____ R.P.M. _____ After Test In.Hg. _____	
		Landing Flap _____ °		

h. General Controllability

- 3.106
- (1) Is the airplane satisfactorily controllable and maneuverable about all three axis during takeoff, climb, level flight, dive and landing (with and without power)? Yes No
 - (2) Is it possible to make a smooth transition from one flight condition to another, including turns and slips, without requiring an exceptional degree of pilot skill, alertness, or strength (by a private pilot) and without danger of exceeding the limit load factor under all conditions of operation probable for the type?..... Yes No
 - (3) Are the control values both for temporary and prolonged application (strength of pilots limits) exceeded in any operation?..... No Yes

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

1. Most Forward C.G. Condition at Maximum T.O. Weight: (continued)

3.120 i. Power Off Stall Characteristics

3.120-1

3.120-2 (1) Conditions

- (a) Hp _____ Ft.
- (b) OAT _____ °F
- (c) Engines idling in low pitch _____ RPM _____ in.Hg.

	Gear Retracted Flaps Retracted	Gear Extended Landing Flaps
(2) Trim 1.5V _{s1} or minimum trim speed MPH-IAS		
(3) Trim 1.5 V _{s1} or minimum trim speed MPH-CAS		
(4) Prior to stall, is speed reduced at rate not greater than 1 MPH/SEC.?	Yes No	Yes No
(5) Speed at which 1 MPH/SEC. first obtained MPH-IAS		
(6) Stall speed MPH-IAS		
(7) Stall speed MPH-CAS		
(8) Is stall limited by control stop?	No Yes	No Yes
(9) Maximum roll (degrees)		
(10) Maximum yaw (degrees)		
(11) Maximum pitch below level (degrees)		
(12) Altitude lost* (feet)		
(13) Maximum IAS during recovery (MPH)		
(14) Maximum CAS during recovery (MPH)		
(15) Maximum acceleration during recovery (G)		

(16) Controllability

	Good	Fair	Poor	Unsatisfactory
(a) Longitudinal:	_____	_____	_____	_____
(b) Lateral:	_____	_____	_____	_____
(c) Directional:	_____	_____	_____	_____

- 3.120-1(b) * Difference in altitude as measured on sensitive altimeter from moment airplane pitches to altitude at which horizontal flight is regained.
- 3.120-1(c) If power is used during recovery, it should not be applied at a speed below 1.2V_{s1}.

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

1. Most Forward C.G. Condition at Maximum T.O. Weight:

i. Power Off Stall Characteristics: (continued)

- (17) For airplanes with independently controlled bank and yaw control, is it possible to produce and to correct roll and yaw by unreversed use of aileron and rudder controls up to time airplane pitches?..... NA Yes No
- (18) For two control airplanes, is it possible to produce and to correct roll by unreversed use of the rolling control without producing excessive yaw up to time airplane pitches? NA Yes No
- (19) Is buffeting violent at the stall?..... No Yes
- (If "yes", describe under "REMARKS")
- (20) Does a clear and distinctive stall warning begin between 5 and 10 m.p.h. above stalling and continue until stall occurs?..... Yes No
- (Describe nature and extent of warning under "REMARKS")
- (21) During recovery:
- (a) Is it possible to prevent more than 15° roll or yaw by normal control use?..... Yes No
- (b) If loss of altitude is over 100 ft., is this information in the AFM, on a placard, or listing?..... NA Yes No
- (c) If pitch is over 30° below level, is this information in the AFM, on a placard, or listing?..... NA Yes No
- (22) Is buffeting at any speed above the stall severe enough to interfere with the satisfactory control of the airplane or cause structural damage or excessive fatigue to the crew? No Yes

REMARKS -

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

1. Most Forward C.G. Condition at Maximum T.O. Weight: (continued)

B.120 j. Power On Stall Characteristics

B.120-1

B.120-2 (1) Conditions

(a) Hp _____ Ft.

(b) OAT _____ °F

(c) Engines at _____ in.Hg. _____ RPM

Power setting for airplanes over 6000 lbs. should not be less than that required to show compliance with normal climb requirements (CAR 3.85(a)), or with 90% M.C. power for airplanes 6000 lbs. or less.

		Gear Retracted Flaps Retracted	Gear Extended Landing Flaps
(2) Trim 1.5V _{s1} or minimum trim speed	MPH-IAS		
(3) Trim 1.5V _{s1} or minimum trim speed	MPH-CAS		
(4) Prior to stall is speed reduced at rate not greater than 1 MPH/SEC.?		Yes No	Yes No
(5) Speed at which 1 MPH/SEC. first obtained	MPH-IAS		
(6) Stall speed	MPH-IAS		
(7) Stall speed	MPH-CAS		
(8) Is stall limited by control stop?		No Yes	No Yes
(9) Maximum roll	(degrees)		
(10) Maximum yaw	(degrees)		
(11) Maximum pitch below level	(degrees)		
(12) Altitude lost *	(feet)		
(13) Maximum IAS during recovery	(MPH)		
(14) Maximum CAS during recovery	(MPH)		
(15) Maximum acceleration during recovery	(G)		

(16) Controllability Good Fair Poor Unsatisfactory

(a) Longitudinal: _____

(b) Lateral: _____

(c) Directional: _____

B.120-1(b) * Difference in altitude as measured on sensitive altimeter from moment airplane pitches to altitude at which horizontal flight is regained.

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

1. Most Forward C.G. Condition at Maximum T.O. Weight:

j. Power On Stall Characteristics: (continued)

- (17) For airplanes with independently controlled bank and yaw controls, is it possible to produce and to correct roll and yaw by unreversed use of aileron and rudder controls up to time airplane pitches?..... NA Yes No
- (18) For two control airplanes, is it possible to produce and to correct roll by unreversed use of the rolling control without producing excessive yaw up to the time airplane pitches?..... NA Yes No
- (19) Is buffeting violent at the stall?..... No Yes
- (If "yes", describe under "REMARKS")
- (20) Does a clear and distinctive stall warning begin between 5 and 10 m.p.h. above stalling and continue until stall occurs?..... Yes No
- (Describe nature and extent of warning under "REMARKS")
- (21) During recovery:
- (a) Is it possible to prevent more than 15° roll or yaw by normal control use?..... Yes No
- (b) If loss of altitude is over 100 ft., is this information in the AFM, on a placard, or listing?... NA Yes No
- (c) If pitch is over 30° below level, is this information in the AFM, on a placard, or listing?..... NA Yes No
- (22) Is buffeting at any speed above the stall severe enough to interfere with the satisfactory control of the airplane or cause structural damage or excessive fatigue to the crew?..... No Yes

REMARKS -

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

1. Most Forward C.G. Condition at Maximum T.O. Weight: (continued)

3.121

3.121-1 k. Stall Characteristics From Excessive Climb Attitude *

(1) Conditions

(a) Hp _____ Ft. (b) OAT _____ °F

3.121-1(b) (c) Engines at _____ in.Hg. _____ RPM

(Power used, if any, to achieve the desired excessive climb or nose high attitude)

		Gear Retracted		Gear Extended	
		Flaps Retracted		Landing Flaps	
		Power On	Power Off	Power On	Power Off
(2) Trim 1.5V _{s1} or minimum trim speed	(MPH-IAS)				
(3) Trim 1.5V _{s1} or minimum trim speed	(MPH-CAS)				
(4) Approx. rate of approach (last 20 mph)	(MPH/Sec.)				
(Should be as high as practicable)					
(5) Approx. climb (attitude horizontal)	(Degrees)				
(Should be as high as practicable)					
(6) Stall speed	(MPH-IAS)				
(7) Stall speed	(MPH-CAS)				
(8) Maximum roll	(Degrees)				
(9) Maximum yaw	(Degrees)				
(10) Maximum pitch below level	(Degrees)				
(11) Altitude lost **	(Feet)				
(12) Maximum IAS during recovery	(MPH)				
(13) Maximum CAS during recovery	(MPH)				
(14) Maximum acceleration during recovery	(G)				

(15) Controllability	<u>Good</u>	<u>Fair</u>	<u>Poor</u>	<u>Unsatisfactory</u>
(a) Longitudinal:	_____	_____	_____	_____
(b) Lateral:	_____	_____	_____	_____
(c) Directional:	_____	_____	_____	_____

* See Section VE3a(9) for one engine inoperative power on stalls

** Difference in altitude as measured on sensitive altimeter from moment airplane pitches to altitude at which horizontal flight is regained.

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

1. Most Forward C.G. Condition at Maximum T.O. Weight:

k. Stall Characteristics From Excessive Climb Attitude: (continued)

(16) Is buffeting violent at the stall?..... No Yes

(17) Are the recovery speeds greater than V_{ne} ?..... No Yes

(18) Are the recovery maximum accelerations greater than the limit positive maneuvering load factor for which the airplane was designed?..... No Yes

(19) Describe stall warning and buffeting: _____

REMARKS

[illegible]

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

1. Most Forward C.G. Condition at Maximum T.O. Weight: (continued)

3.122 1. Power On Coordinated 30° Banked Turn Stall

(1) Conditions

- (a) Hp _____ Ft. (b) OAT _____ °F
- (c) Engine at _____ in.Hg. _____ RPM
- (Setting should be that for 75% M.C. power)
- (d) Landing gear retracted ()
- (e) Flaps retracted ()

(2) Is a steady curvilinear level coordinated flight condition in a 30° bank established?.....	Direction of Turn			
	Right		Left	
	Yes	No	Yes	No
(a) Speed (MPH-IAS)				
(b) Speed (MPH-CAS)				
(3) While maintaining 30° bank, is airplane stalled by steadily tightening the turn with the elevator control?.....	Yes	No	Yes	No
(a) If "no", is stall limited by elevator control stop?.....	Yes	No	Yes	No
(4) Stall speed (MPH-IAS)				
(5) Stall speed (MPH-CAS)				
(6) Maximum roll (Degrees)				
(7) Maximum yaw (Degrees)				
(8) Maximum pitch below level (Degrees)				
(9) Altitude lost * (Feet)				
(10) Maximum IAS during recovery (MPH)				
(11) Maximum CAS during recovery (MPH)				
(12) Maximum acceleration during recovery (G)				

3.120-1(b) * Difference in altitude as measured on sensitive altimeter from moment airplane pitches to altitude at which horizontal flight is regained.

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

1. Most Forward C.G. Condition at Maximum T.O. Weight:

1. Power On Coordinated 30° Banked Turn Stall: (continued)

(13) Controllability	<u>Good</u>	<u>Fair</u>	<u>Poor</u>	<u>Unsatisfactory</u>
(a) Longitudinal:	_____	_____	_____	_____
(b) Lateral:	_____	_____	_____	_____
(c) Directional:	_____	_____	_____	_____

(14) Is recovery to level flight made by normal use of controls?..... Yes No

(15) During recovery to normal level flight

(a) Is there an excessive loss of altitude?..... No Yes

(b) Does airplane have uncontrollable rolling characteristics?..... No Yes

(c) Does airplane have uncontrollable spinning tendencies?..... No Yes

(16) Is buffeting at any speed above the stall severe enough to interfere with the satisfactory control of the airplane, or cause structural damage or excessive fatigue to the crew?..... No Yes

(17) Is buffeting violent at the stall?..... No Yes

(18) Does a clear and distinctive stall warning begin between 5 and 10 m.p.h. above stalling and continue until stall occurs?..... Yes No

(Describe nature and extent of warning under "REMARKS")

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

1. Most Forward C.G. Condition - At Maximum T.O. Weight: (continued)

m. Spins (All single-engine airplanes)

(1) Airplane to be certificated in category: N U A

3.124(b) (2) Category U - is airplane to comply with the
spin requirements of category: N A Not Applicable

3.124(a) (3) Category N
(Normal spin tests (recovery with normal control application))

(a) Configuration (flaps and gear)	Up ()	Down ()	Up ()	Down ()
(b) Trim speed (MPH-IAS)	.9 V_h ()	1.3 V_{so} ()		
(c) Spin entry effected by normal methods (If "no", describe under "REMARKS")	Yes No	Yes No	Yes No	Yes No
(d) Spin maintained 1 turn by full elevator and rudder in pro spin position, ailerons neutral?..... (If "no", describe under "REMARKS")	Yes No	Yes No	Yes No	Yes No
(e) Test data:				
Direction of spin	L R	L R	L R	L R
No. turns spinning	1 1	1 1	1 1	1 1
No. turns recovering				
Maximum recovery speed (MPH-IAS)				
Recovery acceleration (Max. G)				
(f) Any excessive back pressures?.....	No <u>Yes</u>	No <u>Yes</u>	No <u>Yes</u>	No <u>Yes</u>
(g) Recovery effected within one additional turn?.....	Yes <u>No</u>	Yes <u>No</u>	Yes <u>No</u>	Yes <u>No</u>
*(h) Recovery speed exceed placard limit?.....	No <u>Yes</u>	No <u>Yes</u>	No <u>Yes</u>	No <u>Yes</u>
*(i) Recovery acceleration exceed limit positive maneuvering load factor?.....	No <u>Yes</u>	No <u>Yes</u>	No <u>Yes</u>	No <u>Yes</u>

* In the flaps and gear down configuration, flaps may be retracted during recovery.

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

1. Most Forward C.G. Condition at Maximum T.O. Weight:

m. Spins (All single-engined airplanes) (Continued)

3.124(c) (4) Category A

Normal spin tests (recovery with normal control application)

(a) Configuration	(flaps and gear)								Up ()		Down ()	
(b) Trim Speed	(MPH-IAS)								.9V _h ()		1.3V _{so} ()	
(c) Spin entry effected by normal methods?..... (If "no", describe under "REMARKS")									Yes No		Yes No	
(d) Spin maintained by full elevator and rudder in pro spin position, ailerons neutral?..... (If "no", describe under "REMARKS")									Yes No		Yes No	
(e) Test data:												
Direction of spin	L	R	L	R	L	R	L	R	L	R	L	R
No. turns spinning	1	1	2	2	4	4	6	6	1	1		
No. turns recovering												
Recovery speed (Max. IAS)												
Recovery acceleration (Max. G)												
Is there any back pressure? (If "yes", describe under "REMARKS")												
									Yes	No	Yes	No
(f) Is recovery effected within 1 1/2 additional turns in all instances?.....									Yes No		Yes No	
*(g) Does recovery speed exceed placard limit?.....									No	Yes	No	Yes
*(i) Does recovery acceleration exceed limit positive maneuvering load (h) factor?.....									No	Yes	No	Yes
(i) Is airplane capable of spinning at this loading?.....									Yes	No	Yes	No

* In the flaps and gear down position, flaps may be retracted during recovery, provided a placard is installed prohibiting intentional spins with flaps extended.

REMARKS

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics: (continued)

3.106 2. Most Rearward C.G. Condition at Maximum T.O. Weight

- a. Weight _____ lbs.; C.G. _____ % MAC; Ref.: Page _____ Appendix _____
- b. Propeller (See II.C,2)
- c. Were deicers installed? (If "yes", (See II.E,2)..... Yes No

3.115 d. Static Stability and Controllability:

3.112-1 Configuration	Static Longitudinal Stability	Controllability		
		Long.	Lat.	Direct.
(1) Climb Hp _____ Ft., OAT _____ °F 75% M.C. Power () RPM _____ M.P. _____ in.Hg. Gear & flaps retracted () Trim to 1.4V _{s1} _____ MPH-IAS _____ MPH-CAS	Ref. Data Sheet # _____ Stable slope required between 1.2V _{s1} to 1.6V _{s1} Free return speed (friction band) (+ _____ % V trim)(+ _____ MPH-IAS) (- _____ % V trim)(- _____ MPH-IAS) Stable () Unstable ()	Good Fair Poor Unsat.	Good Fair Poor Unsat.	Good Fair Poor Unsat.
(2) Cruise Hp _____ Ft., OAT _____ °F Power to Maintain V _g () RPM _____ M.P. _____ in.Hg. Gear extended () Flaps retracted () Trim to level flight speed _____ MPH-IAS _____ MPH-CAS	Ref. Data Sheet # _____ Stable slope required between 1.3V _{s1} to level flight trim speed or up to speed where stick force is 40 lbs. Free return speed (friction band) (+ _____ % V trim)(+ _____ MPH-IAS) (- _____ % V trim)(- _____ MPH-IAS) Stable () Unstable ()	Good Fair Poor Unsat.	Good Fair Poor Unsat.	Good Fair Poor Unsat.
(3) Cruise Hp _____ Ft., OAT _____ °F 75% M.C. Power () RPM _____ M.P. _____ in.Hg. Gear & flaps retracted () Trim to level flight speed _____ MPH-IAS _____ MPH-CAS	Ref. Data Sheet # _____ Stable slope required between 1.3V _{s1} to V _{ne} or up to speed where stick force is 40 lbs. Free return speed (friction band) (+ _____ % V trim)(+ _____ MPH-IAS) (- _____ % V trim)(- _____ MPH-IAS) Stable () Unstable ()	Good Fair Poor Unsat.	Good Fair Poor Unsat.	Good Fair Poor Unsat.
(4) Approach Hp _____ Ft., OAT _____ °F Power for 3° angle of descent RPM _____ M.P. _____ in.Hg. () Gear extended () Landing flaps _____ ° Trim: 1.5V _{s1} (6000% or less) 1.4V _{s1} (more than 6000%) _____ MPH -IAS _____ MPH-CAS	Ref. Data Sheet # _____ Stable slope required between 1.1V _{s1} to 1.8V _{s1} stick force must not exceed 40 lbs. between these speed limits. Free return speed (friction band) (+ _____ % V trim)(+ _____ MPH-IAS) (- _____ % V trim)(- _____ MPH-IAS) Stable () Unstable ()	Good Fair Poor Unsat.	Good Fair Poor Unsat.	Good Fair Poor Unsat.

(5) Are friction band, stable slope and no reversal of stick force requirements met?..... Yes No

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

Static Longitudinal Stability

Airplane _____ Flight No. _____ Date _____

Weight _____ C.G. at _____ % MAC

Altitude _____ Ft. Flap Position _____ ° Gear Up () Down ()

Required Trim = _____ V_{s1} = _____ CAS V_{s1} _____ MPH-CAS

Required Stable Slope = _____ V_{s1} to _____ CAS to _____ CAS

RPM _____ Manifold pressure _____ in.Hg. BHP _____ (%)

Rated)

Tests Speeds	IAS (MPH)	CAS (MPH)	Stick force (lbs.) (+ For pull, - for push)				
Minimum steady speed for unstalled flight							Airspeed decreased by steady pull in increasing increments
Minimum required for stable slope							
Intermediate							
Intermediate							
Intermediate							
Intermediate							
Free return speed							Friction Band
Trim speed							
Free return speed							Airspeed increased by steady push in increasing increments.
Intermediate							
Intermediate							
Intermediate							
Intermediate							
Intermediate							
Maximum required for stable slope							Airspeed increased by steady push in increasing increments.
Maximum permissible speed							

NOTE: Maximum speed is not required if stick force exceeds 40 pounds.

STATIC LONGITUDINAL STABILITY

3.115

Airplane _____

Weight _____ lbs.

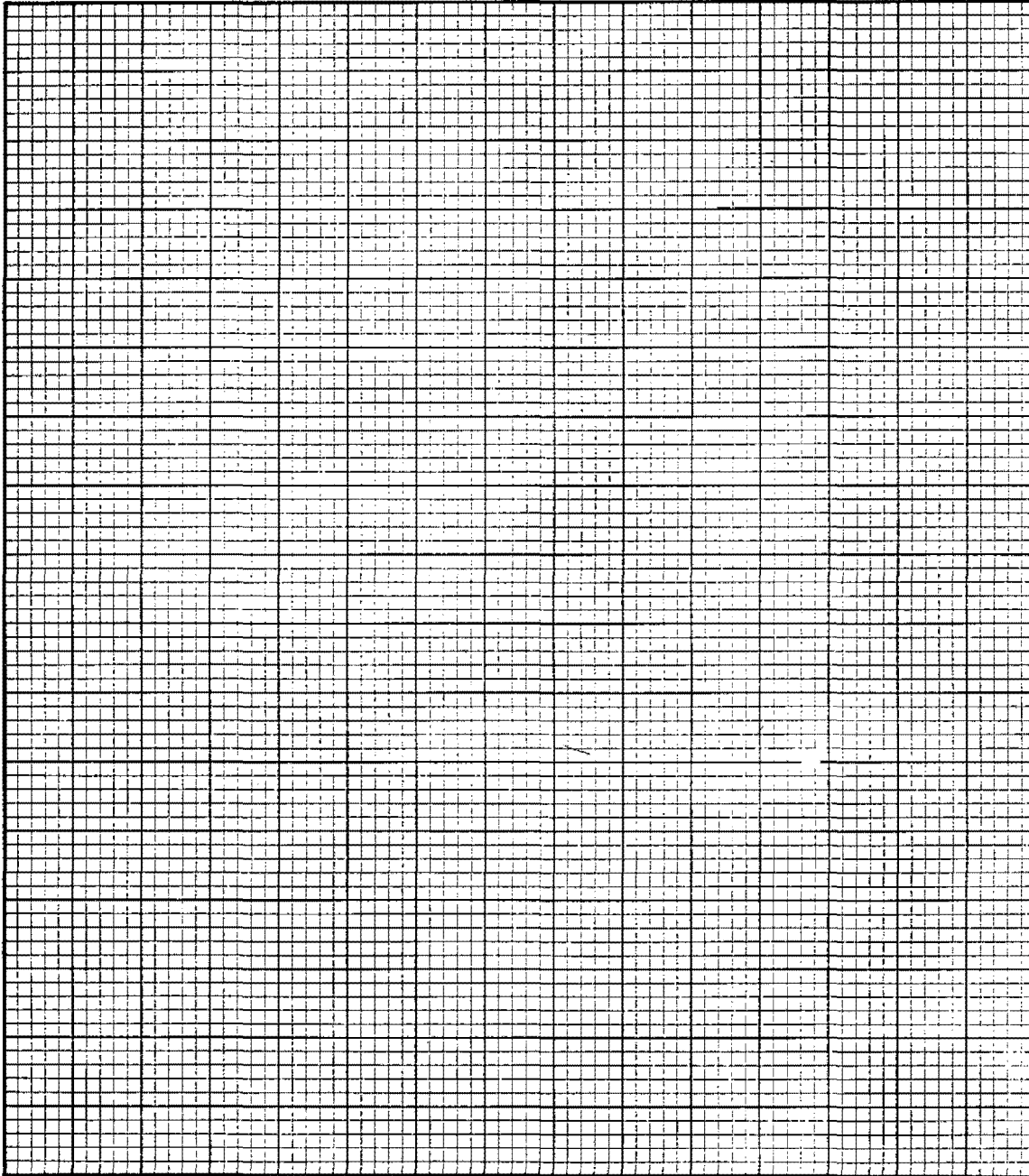
Altitude _____ ft.

C.G. _____ % M.A.C.

Wing Flap Position _____

Power _____

Landing Gear Position _____



CALIBRATED AIRSPEED (M.P.H.)

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

2. Most Rearward C.G. Condition at Maximum T.O. Weight: (continued)

3.112

e. Trim - Longitudinal

Configurations	Information		Trim Longitudinal
	Observed Data	Trim Speed	
(1) Climb M.C. Power () Gear retracted () Flap retracted ()	Hp _____ Ft. RPM _____ M.P. _____ in.Hg. OAT _____ °F	Climb with M.C.Power at a speed between V_x & $1.4V_{sl}$ _____ MPH-IAS _____ MPH-CAS	Trimmed <u>Tail Heavy</u> <u>Nose Heavy</u>
(2) Climb M.C. Power () Gear retracted () Takeoff flaps _____ °	Hp _____ Ft. RPM _____ M.P. _____ in.Hg. OAT _____ °F	Climb with M.C.Power at a speed between V_x & $1.4V_{sl}$ _____ MPH-IAS _____ MPH-CAS	Trimmed <u>Tail Heavy</u> <u>Nose Heavy</u>
(3) Level flight Sufficient power for trim speed () Gear retracted () Flap retracted ()	Hp _____ Ft. RPM _____ M.P. _____ in.Hg. OAT _____ °F	Level flight at power sufficient for the higher of V_x or $1.4V_{sl}$ speeds (indicate by circle which speed used) _____ MPH-IAS _____ MPH-CAS	Trimmed <u>Tail Heavy</u> <u>Nose Heavy</u>
(4) Level flight Sufficient power for trim speed () Gear retracted () Flap retracted ()	Hp _____ Ft. RPM _____ M.P. _____ in.Hg. OAT _____ °F	Level flight at $0.9V_h$ _____ MPH-IAS _____ MPH-CAS	Trimmed <u>Tail Heavy</u> <u>Nose Heavy</u>

Trim - Lateral and Directional

(5) Level flight Sufficient power for trim speed () Gear retracted ()	HP _____ Ft. RPM _____ M.P. _____ in.Hg. OAT _____ °F	Level flight at lower of $0.9V_h$ or V_c (circle which)	Is lateral and directional trim satisfactory? Yes <u>No</u> If "no", explain under "REMARKS"
---	--	---	--

3.109(c) f. Controllability Test For Full Flap Retraction With Simultaneous Application Of M.C.Power At Speed Of $1.1V_{sl}$

Configuration	Information	Result	Force
Steady level flight Power sufficient for speed of $1.1V_{sl}$ () Gear extended () Landing flaps _____ °	Hp _____ ft. Before test (RPM _____) (M.P. _____ In.Hg.) After test (RPM _____) (M.P. _____ In.Hg.) OAT _____ °F	Is exceptional piloting skill (for private pilot required to maintain essentially level flight. No <u>Yes</u>	

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

2. Most Rearward C.G. Condition at Maximum T.O. Weight: (continued)

3.109 g. Longitudinal Control Tests

Configuration (gear extended each case)	Information		Does it require a change in the trim control or the exertion of more control force than can be readily applied with one hand for a short period to.....
	Observed Data	Trim Speed	
(1) Glide Throttles closed () Gear extended () Flaps retracted ()	Hp _____ Ft. OAT _____ °F RPM _____ In. Hg. _____	1.5V _{s1} or minimum trim speed _____ MPH - IAS _____ MPH - CAS	extend the flaps as rapidly as possible to landing position _____ ° while maintaining approx. 1.4 times instantaneous stall speed? No Yes
(2) Glide Throttles closed () Gear extended () Landing flaps _____ °	Hp _____ Ft. OAT _____ °F RPM _____ In. Hg. _____	1.5V _{s1} or minimum trim speed _____ MPH - IAS _____ MPH - CAS	retract the flaps as rapidly as possible, while maintaining approx. 1.4 times instantaneous stall speed? No Yes
(3) Climb M.C. Power () Gear extended () Landing flaps _____ °	Hp _____ Ft. OAT _____ °F RPM _____ In. Hg. _____	1.5V _{s1} or minimum trim speed _____ MPH - IAS _____ MPH - CAS	retract the flaps as rapidly as possible, while maintaining approx. 1.4 times instantaneous stall speed? No Yes
(4) Glide Throttles closed () Gear extended () Flaps retracted ()	Hp _____ Ft. OAT _____ °F RPM _____ In. Hg. _____	1.5V _{s1} or minimum trim speed _____ MPH - IAS _____ MPH - CAS	apply T.O. power quickly while maintaining the same speed? No Yes
(5) Glide Throttles closed () Gear extended () Landing flaps _____ °	Hp _____ Ft. OAT _____ °F RPM _____ In. Hg. _____	1.5V _{s1} or minimum trim speed _____ MPH - IAS _____ MPH - CAS	apply T.O. power quickly while maintaining the same speed? No Yes
(6) Glide Throttles closed () Gear extended () Landing flaps _____ °	Hp _____ Ft. OAT _____ °F RPM _____ In. Hg. _____	1.5V _{s1} or minimum trim speed _____ MPH - IAS _____ MPH - CAS	obtain and maintain speed at 1.1V _{s1} ? (_____ MPH-IAS _____ MPH-CAS) No Yes
(7) Glide Throttles closed () Gear extended () Landing flaps _____ °	Hp _____ Ft. OAT _____ °F RPM _____ In. Hg. _____	1.5V _{s1} or minimum trim speed _____ MPH - IAS _____ MPH - CAS	obtain and maintain speed at the lower of 1.7V _{s1} or V _r No Yes

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

2. Most Rearward C.G. Condition at Maximum T.O. Weight:

g. Longitudinal Control Tests: (continued)

3.109(a) (8) Test to Determine Longitudinal Control Between V_x and V_{s1} in Pitching
Nose Downward for Prompt Acceleration to Speed of V_x

All engines	M.C. Power ()	M.C. Power ()	Power Off ()	Power Off ()
Flap position	Landing _____°	Retracted ()	Landing _____°	Retracted ()
Landing gear	Extended ()	Retracted ()	Extended ()	Retracted ()
Trim speed	V_x	V_x	1.5 V_{s1} or min. trim speed	1.5 V_{s1} or min. trim speed
MPH-IAS _____	_____	_____	_____	_____
MPH-CAS _____	_____	_____	_____	_____
Pressure altitude (Ft.)	_____	_____	_____	_____
Outside air temp. (°F)	_____	_____	_____	_____
Engine RPM	_____	_____	_____	_____
Manifold pressure (in.Hg.)	_____	_____	_____	_____
Lowest speed from which pitch is satisfactory?	_____	_____	_____	_____
MPH-IAS _____	_____	_____	_____	_____
MPH-CAS _____	_____	_____	_____	_____
Is this speed V_{s1} or lower?	Yes <u>No</u>	Yes <u>No</u>	Yes <u>No</u>	Yes <u>No</u>
Alt. lost to regain speed V_x (Ft.)	_____	_____	_____	_____
Is longitudinal control satisfactory?	Yes <u>No</u>	Yes <u>No</u>	Yes <u>No</u>	Yes <u>No</u>

REMARKS

SECTION V. HANDLING QUALITIES:

- E. Flight Characteristics:
3.118-2 2. Most Rearward C.G. Condition at Maximum T.O. Weight: (continued)
3.118(a) h. Directional and Lateral Stability (3 control airplanes)

Configuration, Power, Trim and Data	Kind Stab.	Test Results for Trim Speeds Between 1.2Vsl to Maximum Permissible
<u>Configuration and Power</u> Gear Up () Flaps Up () <u>Trim at several speeds (MPH) from 1.2Vsl to Vne</u> 1.2Vsl _____ IAS _____ CAS _____ _____ IAS _____ CAS _____ _____ IAS _____ CAS _____ _____ IAS _____ CAS _____ Vne _____ IAS _____ CAS _____ <u>Observed Data</u> HP _____ Ft., OAT _____ °F M.P. _____ in.Hg., RPM _____ M.P. _____ in.Hg., RPM _____	MCP	Is tendency positive to recover from a skid with rudder free?... Yes <u>No</u> Does control force increase steadily with deflection?..... Yes <u>No</u> What is the rudder pedal force at maximum deflection? Right _____ lbs. Left _____ lbs. What bank angle is required to hold a constant heading? _____ °
	75% MCP	Is the tendency to raise the low wing in a side slip: (1) Positive at Vne?..... Yes <u>No</u> (2) Negative at 1.2Vsl?..... No <u>Yes</u> (a) If positive, record time required to recover from a _____ ° bank. Right _____ Sec. Left _____ Sec. Does control force increase steadily with deflection?..... Yes <u>No</u>
	Dynamic 75% MCP	Are any short period oscillations occurring between stall and Vne heavily damped with the primary controls: (1) Lateral (a) Free?..... Yes <u>No</u> (b) Fixed?..... Yes <u>No</u> (2) Directional (a) Free?..... Yes <u>No</u> (b) Fixed?..... Yes <u>No</u>

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

3.118-2 2. Most Rearward C.G. Condition at Maximum T.O. Weight:

3.118(a) h. Directional and Lateral Stability (3 control airplanes): (continued)

Configuration, Power, Trim and Data	Kind Stab.	Test Results for Trim Speeds Between 1.2V _{s1} to Maximum Permissible
<u>Configuration and Power</u> Gear extended () Flaps in takeoff position _____ ° () Several speeds from 1.2V _{s1} _____ IAS CAS to V _f or maximum gear speed (circle which) 1.2V _{s1} _____ IAS _____ CAS _____ IAS _____ CAS _____ IAS _____ CAS _____ IAS _____ CAS V _f or gear _____ IAS _____ CAS <u>Observed Data</u> Hp _____ Ft., OAT _____ °F M.P. _____ in.Hg., RPM _____ M.P. _____ in.Hg., RPM _____	MCP	Is tendency positive to recover from a skid with rudder free?.. Yes <u>No</u> Does control force increase steadily with deflection?..... Yes <u>No</u> What is the rudder pedal force at maximum deflection? Right _____ lbs. Left _____ lbs. What bank angle is required to hold a constant heading? _____ °
	75% MCP	Is the tendency to raise the low wing in a side slip: (1) Positive at V _f or gear?.. Yes <u>No</u> (2) Negative at 1.2V _{s1} ?..... No <u>Yes</u> (a) If positive, record time required to recover from a _____ ° bank. Right _____ Sec. Left _____ Sec. Does control force increase steadily with deflection?..... Yes <u>No</u>
	75% MCP	Are any short period oscillations occurring between stall and V _f or gear heavily damped with the primary controls: (1) Lateral (a) Free?..... Yes <u>No</u> (b) Fixed?..... Yes <u>No</u> (2) Directional (a) Free?..... Yes <u>No</u> (b) Fixed?..... Yes <u>No</u>

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

2. Most Rearward C.G. Condition at Maximum T.O. Weight:

3.118(a) h. Directional and Lateral Stability (3 control airplanes): (continued)
3.118-2

Configuration, Power, Trim and Data	Kind Stab.	Test Results for Trim Speeds Between 1.2V _{s1} to Maximum Permissible
<u>Configuration and Power</u> Throttles Closed () Gear Up () Flaps Up () <u>Trim</u> at several speeds (MPH) from 1.2V _{s1} to V _{he} 1.2V _{s1} IAS CAS IAS CAS IAS CAS V _{he} IAS CAS <u>Observed Data</u> HP Ft., OAT °F M.P. in.Hg., RPM	Directional	Is tendency positive to recover from a skid with rudder free?.. Yes <u>No</u> Does control force increase steadily with deflection?..... Yes <u>No</u> What is the rudder pedal force at maximum deflection? Right lbs. Left lbs. What bank angle is required to hold a constant heading? °
	Lateral	Is the tendency to raise the low wing in a side slip: (1) Positive at V _{he} ?..... Yes <u>No</u> (2) Negative at 1.2V _{s1} ?..... No <u>Yes</u> (a) If positive, record time required to recover from a ° bank. Right Sec. Left Sec. Does control force increase steadily with deflection?..... Yes <u>No</u>
	Dynamic	Are any short period oscillations occurring between stall and V _{he} heavily damped with the primary controls: (1) Lateral (a) Free?..... Yes <u>No</u> (b) Fixed?..... Yes <u>No</u> (2) Directional (a) Free?..... Yes <u>No</u> (b) Fixed?..... Yes <u>No</u>

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

2. Most Rearward C.G. Condition at Maximum T.O. Weight:

3.118(a) h. Directional and Lateral Stability (3 control airplanes): (continued)
3.118-2

Configuration, Power, Trim and Data	Kind Stab.	Test Results for Trim Speeds Between 1.2Vsl to Maximum Permissible
<p align="center"><u>Configuration and Power</u></p> <p>Throttles Closed ()</p> <p>Gear Extended ()</p> <p>Flaps in takeoff position ____° ()</p> <p>Several speeds from 1.2Vsl ____ IAS ____ CAS to V_f or maximum gear speed (circle which)</p> <p>1.2Vsl ____ IAS ____ CAS</p> <p>____ IAS ____ CAS</p> <p>____ IAS ____ CAS</p> <p>____ IAS ____ CAS</p> <p>V_f or gear ____ IAS ____ CAS</p> <p align="center"><u>Observed Data</u></p> <p>Hp ____ Ft., OAT ____° F</p> <p>M.P. ____ in.Hg., RPM ____</p>	Directional	<p>Is tendency positive to recover from a skid with rudder free?.. Yes <u>No</u></p> <p>Does control force increase steadily with deflection?..... Yes <u>No</u></p> <p>What is the rudder pedal force at maximum deflection?</p> <p>Right ____ lbs.</p> <p>Left ____ lbs.</p> <p>What bank angle is required to hold a constant heading? ____°</p>
		Lateral
	Dynamic	

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

2. Most Rearward C.G. Condition at Maximum T.O. Weight: (continued)

3.118 1. Test for Rudder Lock (3 control airplanes)

(1) Power setting	50% M.C. Power	Power Off	50% M.C. Power	Power Off
(2) Landing gear position	Retracted	Retracted	Extended	Extended
(3) Flap position	Retracted	Retracted	Ldg. °	Ldg. °
(4) Speed (MPH-IAS)				
(5) Speed (MPH-CAS) (See item "11" below for speeds)				
(6) Pressure altitude (Feet)				
(7) Outside air temperature (°F)				
(8) RPM				
(9) Manifold pressure (in.Hg.)				
(10) In straight steady sideslips:				
(a) Do the aileron and rudder control movements and forces increase steadily as the angle of sideslip is increased?	Yes No	Yes No	Yes No	Yes No
(b) Is rate of increase of control movements and forces satisfactory up to the extreme angles of sideslip considered appropriate to the type?.....	Yes No	Yes No	Yes No	Yes No
(c) Is the limit at maximum angles of sideslip obtained by control force of 150 lbs. or maximum rudder travel?....				
(d) Do the rudder pedal forces reverse?...	No Yes	No Yes	No Yes	No Yes
(e) Does sufficient bank accompany sideslipping to indicate adequately any departure from steady, unyawed flight?.....	Yes No	Yes No	Yes No	Yes No
(11) Speeds for item (5) above:				
For all aircraft: 1.2V _{s1} at all gear and flap positions				

3.117 j. "Formerly called for longitudinal short period oscillation" investigation. Omitted since item already covered by item II F 5 under flutter investigation.

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

2. Most Rearward C.G. Condition at Maximum T.O. Weight: (continued)

3.118(b) k. Directional Stability (2 control airplane)

Is the directional stability adequate by demonstrating that the airplane can be rapidly rolled from a 45° bank to a 45° bank in the opposite direction without exhibiting dangerous skidding characteristics with the airplane in the configuration of (flaps and landing gear up), (landing flaps and landing gear down), (power off and 75% M.C. power) and over a range of speeds considered appropriate for the airplane?.....

Yes No

3.118(b) 1. Lateral Stability (2 control airplane)

(1) Are flaps and landing gear retracted?..... NA

Yes No

(2) Is airplane trimmed for level flight at

(a) The lower of 0.9 of high speed in level flight or V_0 ?

Yes No

Which is lower _____, and what are speed values _____ MPH-IAS _____ MPH-CAS

(3) Is lateral stability adequate by demonstrating that the airplane will not assume a dangerous attitude or speed when all the controls are abandoned for a period of two minutes when in the above configuration?.....

Yes No

3.118(b) m. Dynamic Stability (2 control airplane)

Is any short period oscillation between stalling speed and the maximum permissible speed heavily damped with primary controls:

(1) Free?.....

Yes No

(2) Fixed?.....

Yes No

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

2. Most Rearward C.G. Condition at Maximum T.O. Weight: (continued)

.106 n. General Controllability

- (1) Is the airplane satisfactorily controllable and maneuverable about all three axes during takeoff, climb, level flight, dive and landing (with and without power)?..... Yes No
- (2) Is it possible to make a smooth transition from one flight condition to another, including turns and slips, without requiring an exceptional degree of skill, alertness, or strength on the part of the pilot (private) and without danger of exceeding the limit load factor under all conditions of operating probable for the type?..... Yes No
- (3) Are the control values both for temporary and prolonged application (strength of pilots limits) as listed in CAR 3.106 exceeded in any operation?..... No Yes

o. Acrobatic Controllability (Applicable to Categories U and A only)

- .108-A (1) It is demonstrated that the following acrobatic maneuvers
 .107-U are performed readily and safely?..... NA Yes No
 .778(e)(2),(3)

Maneuvers	Maximum Safe Entry Speeds (M.P.H.)	
(a) Stalls (except whip stalls) (accelerated or high speed stalls)	____ IAS	____ CAS
(b) Steep turns (over 60° bank)	____ IAS	____ CAS
(c) Spin (except when placarding against same)	____ IAS	____ CAS
(d) Lazy eights	____ IAS	____ CAS
(e) Chandelle	____ IAS	____ CAS
(f) _____	____ IAS	____ CAS
(g) _____	____ IAS	____ CAS

- (2) Are the above maneuvers listed with recommended entry speeds in the Airplane Flight Manual?..... Yes No

* (These items to be investigated for Utility Category, and are minimum required for Acrobatic Category).

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

2. Most Rearward C.G. Condition at Maximum T.O. Weight: (continued)

3.120 p. Power Off Stall Characteristics

3.120-1

3.120-2 (1) Conditions

(a) Hp _____ Ft. (b) OAT _____ °F

(c) Engines idling in low pitch _____ RPM _____ in.Hg.

	Gear Retracted Flaps Retracted	Gear Extended Landing Flaps
(2) Trim 1.5Vs1 or minimum trim speed (MPH-IAS)		
(3) Trim 1.5Vs1 or minimum trim speed (MPH-CAS)		
(4) Prior to stall, is speed reduced at rate not greater than 1 MPH/SEC.?.....	Yes No	Yes No
(5) Speed at which 1 MPH/SEC. first obtained (MPH-IAS)		
(6) Stall speed (MPH-IAS)		
(7) Stall speed (MPH-CAS)		
(8) Is stall limited by control stop?.....	No Yes	No Yes
(9) Maximum roll (degrees)		
(10) Maximum yaw (degrees)		
(11) Maximum pitch below level (degrees)		
(12) Altitude lost * (feet)		
(13) Maximum IAS during recovery (MPH)		
(14) Maximum CAS during recovery (MPH)		
(15) Maximum acceleration during recovery (G)		

(16) Controllability Good Fair Poor Unsatisfactory

(a) Longitudinal: _____

(b) Lateral: _____

(c) Directional: _____

* Difference in altitude as measured on sensitive altimeter from moment airplane pitches to altitude at which horizontal flight is regained.

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

2. Most Rearward C.G. Condition at Maximum T.O. Weight:

p. Power Off Stall Characteristics: (continued)

- (17) For airplanes with independently controlled bank and yaw control, is it possible to produce and to correct roll and yaw by unreversed use of aileron and rudder controls up to time airplane pitches?..... NA Yes No
- (18) For 2 control airplanes, is it possible to produce and to correct roll by unreversed use of the rolling control without producing excessive yaw up to time airplane pitches?..... NA Yes No
- (19) Is buffeting violent at the stall?..... No Yes
- (If "yes", describe under "REMARKS")
- (20) Does a clear and distinctive stall warning begin between 5 and 10 m.p.h. above stalling and continue until stall occurs?..... Yes No
- (Describe nature and extent of warning under "REMARKS")
- (21) During recovery:
- (a) Is it possible to prevent more than 15° roll or yaw by normal control use?..... Yes No
- (b) If loss of altitude is over 100 feet, is this information in the AFM, on a placard, or listing?.... NA Yes No
- (c) If pitch is over 30° below level, is this information in the AFM, on a placard, or listing?..... NA Yes No
- .159 (22) Is buffeting at any speed above the stall severe enough to interfere with the satisfactory control of the airplane or cause structural damage or excessive fatigue to the crew?..... No Yes

REMARKS

SECTION A. HANDLING QUALITIES:

E. Flight Characteristics:

2. Most Rearward C.G. Condition at Maximum T.O. Weight:
p. Power Off Stall Characteristics: (continued)

		Yes	No	Yes	No
(1) For airplanes with independently controlled bank and yaw control, is it possible to produce and to correct roll and yaw by unreversed use of aileron and rudder controls without producing excessive yaw up to time airplane pitches?					
(2) For 2 control airplanes, is it possible to produce and to correct roll by unreversed use of the rolling control without producing excessive yaw up to time airplane pitches?					
(3) Is buffeting violent at the stall?					
(4) If "yes", describe under "REMARKS"					
(5) Does a clear and distinctive stall warning begin between 5 and 10 m.p.h. above stalling and continue until stall occurs?					
(6) Trim 1.5Vs1 or minimum trim speed (MPH-IAS)					
(7) Trim 1.5Vs1 or minimum trim speed (MPH-CAS)					
(8) Prior to stall is speed reduced at rate not greater than 1 MPH per second?		Yes	No	Yes	No
(9) Speed at which 1 MPH/SEC. first obtained (MPH-IAS)					
(10) Stall speed (MPH-IAS)					
(11) Stall speed (MPH-CAS)					
(12) Is stall limited by control stop?		No	Yes	No	Yes
(13) Maximum roll (degrees)					
(14) Maximum yaw (degrees)					
(15) Maximum pitch below level (degrees)					
(16) Altitude lost * (feet)					
(17) Maximum IAS during recovery (MPH)					
(18) Maximum CAS during recovery (MPH)					
(19) Maximum acceleration during recovery (G)					

(16) Controllability	<u>Good</u>	<u>Fair</u>	<u>Poor</u>	<u>Unsatisfactory</u>
(a) Longitudinal:	_____	_____	_____	_____
(b) Lateral:	_____	_____	_____	_____
(c) Directional:	_____	_____	_____	_____

* Difference in altitude as measured on sensitive altimeter from moment airplane pitches to altitude at which horizontal flight is regained.

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

2. Most Rearward C.G. Condition at Maximum T.O. Weight:
g. Power On Stall Characteristics: (continued)

(3) Trim 1.5Vsl or minimum trim speed	(MPH-CAS)		
(4) Prior to stall, is speed reduced at rate not greater than 1 MPH/SEC.?.....		Yes <u>No</u>	Yes <u>No</u>
(5) Speed at which 1 MPH/SEC. first obtained	(MPH-IAS)		
(6) Stall speed	(MPH-IAS)		
(7) Stall speed	(MPH-CAS)		
(8) Is stall limited by control stop?.....		No Yes	No Yes
(9) Maximum roll	(degrees)		
(10) Maximum yaw	(degrees)		
(11) Maximum pitch below level	(degrees)		
(12) Altitude lost *	(feet)		
(13) Maximum IAS during recovery	(MPH)		
(14) Maximum CAS during recovery	(MPH)		
(15) Maximum acceleration during recovery	(G)		

(16) Controllability	<u>Good</u>	<u>Fair</u>	<u>Poor</u>	<u>Unsatisfactory</u>
(a) Longitudinal:	_____	_____	_____	_____
(b) Lateral:	_____	_____	_____	_____
(c) Directional:	_____	_____	_____	_____

* Difference in altitude as measured on sensitive altimeter from moment airplane pitches to altitude at which horizontal flight is regained.

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

2. Most Rearward C.G. Condition at Maximum T.O. Weight: (continued)

3.121 r. Stall Characteristics From Excessive Climb Attitude *

3.121-1

(1) Conditions

(a) Hp _____ Ft.

(b) OAT _____ °F

(c) Engines at _____ in.Hg. _____ RPM

Power used, if any, to achieve the critical "excessive climb or nose high attitude".

	Gear Retracted Flaps Retracted		Gear Extended Landing Flaps	
	Power On	Power Off	Power On	Power Off
(2) Trim speed approximately 1.5Vs1 (MPH-IAS)				
(3) Trim speed approximately 1.5Vs1 (MPH-CAS)				
(4) Approx. climb attitude to horizontal (degrees) (Should be as high as practicable)				
(5) Rate of approach (last 20 mph) (MPH/SEC) (Should be as high as practicable)				
(6) Stall speed (MPH-IAS)				
(7) Stall speed (MPH-CAS)				
(8) Maximum roll (degrees)				
(9) Maximum yaw (degrees)				
(10) Maximum pitch below level (degrees)				
(11) Altitude lost ** (feet)				
(12) Maximum IAS during recovery (MPH)				
(13) Maximum CAS during recovery (MPH)				
(14) Maximum acceleration during recovery (G)				

* See Section VE3a(9) for one engine inoperative power on stalls

** Difference in altitude as measured on sensitive altimeter from moment airplane pitches to altitude at which horizontal flight is regained.

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

2. Most Rearward C.G. Condition at Maximum T.O. Weight:

r. Stall Characteristics From Excessive Climb Attitude: (continued)

(15) Controllability	<u>Good</u>	<u>Fair</u>	<u>Poor</u>	<u>Unsatisfactory</u>
(a) Longitudinal:	_____	_____	_____	_____
(b) Lateral:	_____	_____	_____	_____
(c) Directional:	_____	_____	_____	_____
(16) Is buffeting violent at the stall?.....	No	Yes		
(17) Are the recovery speeds greater than V_{ne} ?.....	No	<u>Yes</u>		
(18) Are the recovery maximum accelerations greater than the limit positive maneuvering load factor for which the airplane was designed?.....	No	<u>Yes</u>		
(19) Describe stall warning and buffeting:_____				

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

2. Most Rearward C.G. Condition at Maximum T.O. Weight: (continued)

3.122 s. Power On Coordinated 30° Banked Turn Stall, Left And Right

(1) Conditions

(a) Hp _____ Ft.

(b) OAT _____ °F

(c) Engine at _____ in.Hg. _____ RPM

Setting should be that for 75% M.C. power

(d) Landing gear retracted ()

(e) Flaps retracted ()

	Left	Right
(2) Is a steady curvilinear level coordinated flight condition in a 30° bank established?.....	Yes <u>No</u>	Yes <u>No</u>
(a) Speed (MPH-IAS)		
(b) Speed (MPH-CAS)		
(3) While maintaining 30° bank, is airplane stalled by steadily tightening the turn with the elevator control?.....	Yes <u>No</u>	Yes <u>No</u>
(a) If "no", is stall limited by elevator control stop?.....	Yes <u>No</u>	Yes <u>No</u>
(4) Stall speed (MPH-IAS)		
(5) Stall speed (MPH-CAS)		
(6) Maximum roll (degrees)		
(7) Maximum yaw (degrees)		
(8) Maximum pitch below level (degrees)		
(9) Altitude lost * (feet)		
(10) Maximum IAS during recovery (MPH)		
(11) Maximum CAS during recovery (MPH)		
(12) Maximum acceleration during recovery (G)		

* Difference in altitude as measured on sensitive altimeter from moment airplane pitches to altitude at which horizontal flight is regained.

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

2. Most Rearward C.G. Condition at Maximum T.O. Weight:

3.122 s. Power On Coordinated 30° Banked Turn Stall, Left And Right: (continued)

(13) Controllability Good Fair Poor Unsatisfactory

(a) Longitudinal: _____

(b) Lateral: _____

(c) Directional: _____

(14) Is recovery to level flight made by normal use of controls?..... Yes No

(15) During recovery to normal level flight:

(a) Is there an excessive loss of altitude?..... No Yes

(b) Does airplane have uncontrollable rolling characteristics?..... No Yes

3.159 (c) Does airplane have uncontrollable spinning tendencies?..... No Yes

(16) Is buffeting at any speed above the stall severe enough to interfere with the satisfactory control of the airplane, or cause structural damage or excessive fatigue to the crew?..... No Yes

(17) Is buffeting violent at the stall?..... No Yes

3.120 (18) Does a clear and distinctive stall warning begin between 5 and 10 m.p.h. above stalling and continue until stall occurs?..... Yes No

(Describe nature and extent of warning under "REMARKS")

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

2. Most Rearward C.G. Condition at Maximum T.O. Weight: (continued)

t. Spins

3.124(b) (1) Airplane to be certificated in which category? N U A

(2) Category U - Is airplane to comply with the spin

requirements of category: Normal () Acrobatic () Not Applicable ()

3.124(a) (3) Category N - (All single-engine airplanes)

Normal spin tests (recovery with normal control application)

(a) Configuration (flaps & gear)	Up ()	Down ()	Up ()	Down ()
(b) Trim speed (MPH-IAS)	.9V _h ()	1.3V _{so} ()		
(c) Spin entry effected by normal methods..... (If "no", describe under "REMARKS")	Yes No	Yes No	Yes No	Yes No
(d) Spin maintained 1 turn by full elevator and rudder in pro spin position, ailerons neutral?	Yes No	Yes No	Yes No	Yes No
(e) Test data:				
Direction of spin	L R	L R	L R	L R
No. turns spinning	1 1	1 1	1 1	1 1
No. turns recovering				
Maximum recovery speed (MPH-IAS)				
Recovery acceleration (Max. G)				
(f) Any excessive back pressures?.....				
(g) Recovery effected within one additional turn?	Yes No	Yes No	Yes No	Yes No
* (h) Recovery speed exceed placard limit?.....	No Yes	No Yes	No Yes	No Yes
* (i) Recovery acceleration exceed limit positive maneuvering load factor?.....	No Yes	No Yes	No Yes	No Yes

* In the flaps and gear down configuration, flaps may be retracted during recovery.

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

2. Most Rearward C.G. Condition at Maximum T.O. Weight:

t. Spins

B.124(a) (3) Category N (continued)

Uncontrollable spin tests (power on, or abnormal use of controls for entry into, maintenance of, or recovery from a spin)

(a) Configuration (flaps & gear)	Up ()	Down ()	Up ()	Down ()
(b) Trim speed (MPH-IAS)	.9V _h ()	1.3V _{so} ()		
(c) Spin entry affected by abnormal control or power use?..... (If "yes", describe under "REMARKS")	Yes No	Yes No	Yes No	Yes No
(d) Can spin be maintained the desired number of turns with power off by any possible use of the controls?..... (If "yes", describe under "REMARKS")	Yes No	Yes No	Yes No	Yes No
(e) Test data:				
Direction of spin	L R	L R	L R	L R
No. of turns spinning				
No. of turns recovering				
Maximum recovery speed (MPH-IAS)				
Maximum recovery acceleration (G)				
(f) Spin recovery require abnormal control use or more than one additional turn when normal control recovery procedure used?....	No Yes	No Yes	No Yes	No Yes
(g) Any back pressures?.....	No Yes	No Yes	No Yes	No Yes
(h) Recovery speed exceed placard limits?.....	No Yes	No Yes	No Yes	No Yes
(i) Recovery acceleration exceed limit positive maneuvering load factor?.....	No Yes	No Yes	No Yes	No Yes

* In the flaps and gear down position, flaps may be retracted during recovery

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

2. Most Rearward C.G. Condition at Maximum T.O. Weight:

t. Spins: (continued)

(4) Categories N - U

3.124(a)

(a) Does applicant desire airplane to be designated
"characteristically" incapable of spinning?..... Yes No

(If "yes", perform the following:)

(1) Is airplane capable of being spun in any con-
figuration and from non-acrobatic maneuver;
i.e., power on or off, flaps and gear up or
down?..... No Yes

(If "yes", describe fully under "REMARKS")

(2) With airplane modified as indicated below, is
airplane capable of being spun in any configu-
ration and from any non-acrobatic maneuver;
i.e., power on or off, flaps and gear up or
down?..... No Yes

(If reply is "yes", describe fully under
"REMARKS")

Is gross weight 5% in excess of T.O. weight?
(_____lbs.) Yes No

Is center of gravity at least 3% aft of the
rearmost position for which approval is de-
sired(_____% MAC)? Yes No

What is reference page _____ appendix _____
for above.

Is elevator up travel 4° in excess of the normal
elevator travel stop limit?..... Yes No

(What is this up range _____ degrees)?

Is rudder travel in each direction increased by
7° over that limited by the normal rudder travel
stop?..... Yes No

(What is this new rudder range _____
degrees)?

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

2. Most Rearward C.G. Condition at Maximum T.O. Weight:

t. Spins

(4) Categories N - U: (continued)

(b) Placards (Categories N and U only)

- (1) Category N - Is the airplane placarded against spins?..... Yes No
- (2) Category U - If the airplane has been demonstrated to meet Category A spin requirements, is a placard placed in the cockpit setting forth the use of controls required for recovery from spinning maneuvers?..... NA Yes No

REMARKS

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

2. Most Rearward C.G. Condition at Maximum T.O. Weight:

t. Spins: (continued)

3.124(c) (5) Category A

3.124-2

Normal spins (recovery with normal control application)

(a) Configuration	(flaps and gear)	Up ()	Down ()
(b) Trim speed	(MPH-IAS)	.9V _h ()	1.3V _{so} ()
(c) Is spin entry effected by normal methods? (If "no", describe under "REMARKS")		Yes No	Yes No
(d) Is spin maintained by full elevator and rudder in pro spin position, ailerons neutral? (If "no", describe under "REMARKS")		Yes No	Yes No
(e) Test data:			
Direction of spin	L R L R L R L R L R		
No. turns spinning	1 1 2 2 4 4 4 6 1 1		
No. turns recovering			
Recovery speed (Max. IAS)			
Recovery acceleration (Max. G)			
(f) Any back pressure? (If "yes", describe)		Yes No	Yes No
(g) Is recovery effected within 1 1/2 additional turns in all instances?		Yes No	Yes No
(h) Does recovery speed exceed placard limit?*		No Yes	No Yes
(i) Does recovery acceleration exceed limit positive maneuvering load factor?*		No Yes	No Yes
(j) Is airplane capable of spinning?		Yes No	Yes No

* In the flaps and gear down position, flaps may be retracted during recovery, provided a placard is installed prohibiting intentional spins with flaps extended.

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

2. Most Rearward C.G. Condition at Maximum T.O. Weight:

t. Spins:

3.124(c) (5) Category A (continued)

3.124-2

Uncontrollable spin tests (power on or abnormal use of controls for entry into, maintenance of, or recovery from a spin.)

(a) Configuration	(flaps and gear)						Up ()		Down ()		
(b) Trim speed	(MPH-IAS)						.9V _h ()		1.3V _{so} ()		
(c) Is spin entry effected by abnormal control or power use? (If "yes", describe under "REMARKS")								Yes No		Yes No	
(d) Can spin be maintained with power off by abnormal control position (elevator full forward, or aileron off neutral)? (If "yes", describe under "REMARKS")								Yes No		Yes No	
(e) Test data:											
Direction of spin	L	R	L	R	L	R	L	R	L	R	
No. turns spinning	1	1	2	2	4	4	6	6	1	1	
No. turns recovering											
Recovery speed (Max. IAS)											
Recovery acceleration (Max. G)											
(f) Does spin recovery require abnormal control use or more than 1 1/2 additional turns when normal control recovery procedure is used?								No Yes		No Yes	
(g) Any back pressures?								No Yes		No Yes	
*(h) Does recovery speed exceed placard limits?								No Yes		No Yes	
*(i) Does recover acceleration exceed limit positive maneuvering load factor?								No Yes		No Yes	

* In the flaps and gear down condition, flaps may be retracted during recovery, if necessary, to avoid exceeding V_f or acceleration limits.

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

2. Most Rearward C.G. Condition at Maximum T.O. Weight:

t. Spins:

(5) Category A (continued)

Placard (Category A only)

(a) Is a placard placed in the cockpit setting forth the use of controls required for recovery from spinning maneuvers?.....

Yes No

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SECTION V. HANDLING QUALITIES:

E. Flight Characteristics: (continued)

3. Multiengine Flight Characteristics With Critical Engine Inoperative

a. Most Rearward C.G. Condition at Maximum T.O. Weight

(1) Weight _____ lbs.; C.G. _____ % MAC; Ref.: Page _____ Appendix _____

(2) Propeller (See II.C,2)

(3) Were deicers installed?..... Yes No

(If "yes" (See II.E,2)

3.112 (4) * Trim - Critical Engine Inoperative and flaps retracted

Configuration	Information		Trim	
	Observed Data	Trim Speed	Longitudinal	Directional
Climb Critical inoperative engine Left () Right ()	Hp _____ Ft. OAT _____ °F	Climb with M.C. Power on operating engines	Trimmed	Trimmed
Gear retracted ()	Bank _____ ° 5° Max.	(Between V_y & $1.4V_{s1}$ speeds)	Elevator Tab Position _____	Rudder Tab Position _____
Is inoperative propeller in least drag position? Yes No	RPM _____ In.Hg. _____	_____ MPH-IAS	<u>Tail Heavy</u>	<u>Yaws Left</u>
Operating engine(s) at M.C. Power	RPM _____ In.Hg. _____	_____ MPH-CAS	<u>Nose Heavy</u>	<u>Yaws Right</u>

* (Parts of Sections 3 (5) and (6) may be performed with this test providing configurations are similar.)

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

3. Multiengine Flight Characteristics With Critical Engine Inoperative:

a. Most Rearward C.G. Condition at Maximum T.O. Weight: (continued)

3.110(a) (5) Lateral Control

(a) Landing gear position	Up	Down
(b) Wing flaps (most favorable climb position) (°)	_____°	_____°
(c) Critical inoperative engine?	Left, Right	Left, Right
Is inoperative propeller in minimum drag position?	Yes No	Yes No
If windmilling, what is RPM? (RPM)		
(d) Are other engine(s) operating at M.C. power	Yes No	Yes No
RPM		
Manifold pressure (in.Hg.)		
(e) Is trim speed in climb at V_y or $1.4V_{sl}$?	Yes No	Yes No
State which _____.		
MPH-IAS		
MPH-CAS		
(f) Pressure altitude of test (Ft.)		
(g) Outside air temperature (°F)		
(h) Can 15° banked turns be made to left?	Yes No	Yes No
(i) Can 15° banked turns be made to right?	Yes No	Yes No
(j) Do control forces increase proportionately with deflection?	Yes No	Yes No
(k) What is maximum force at maximum deflection? Rudder		
Aileron		

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

3. Multiengine Flight Characteristics With Critical Engine Inoperative:

a. Most Rearward C.G. Condition at Maximum T.O. Weight: (continued)

3.110(b) (6) Directional Control		
15° Change in Heading With and Against Inoperative Engine		
(a) Landing gear position	<u>Retracted</u>	<u>Extended</u>
(b) Wing flaps (most favorable climb position) (degrees)		
(c) Critical inoperative engine?	Left, Right	Left, Right
State minimum drag position of inoperative propeller		
If rotating, what is RPM?		
(d) Are other engines operating at M.C. power?	Yes <u>No</u>	Yes <u>No</u>
RPM		
Manifold pressure (in.Hg.)		
(e) Is trim speed in climb at or below V_y or $1.4V_{si}$?	Yes <u>No</u>	Yes <u>No</u>
(MPH-IAS)		
(MPH-CAS)		
(f) Pressure altitude (ft.)		
(g) Outside air temperature (°F)		
(h) During test, are wings level laterally within 5°?	Yes <u>No</u>	Yes <u>No</u>
(i) Are any dangerous characteristics encountered when heading is suddenly altered 15° to left, or to heading where rudder force is 150 lbs.? (If heading is limited by rudder force, describe details and state heading in "REMARKS")	<u>Yes</u> No	<u>Yes</u> No
(j) Are any dangerous characteristics encountered when heading is suddenly altered 15° to right, or to heading where rudder force is 150 lbs.? (If heading is limited by rudder force, describe details and state heading in "REMARKS")	<u>Yes</u> No	<u>Yes</u> No
(lbs.)		
(degrees)		

NOTE: Gear down is usually most critical for nose wheel planes and gear up for tail wheel planes. If inspector is uncertain, conduct test in both positions.

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

3. Multiengine Flight Characteristics With Critical Engine Inoperative:

a. Most Rearward C.G. Condition at Maximum T.O. Weight: (continued)

3.111

3.106 (7) Minimum Control speed

(a) Is landing gear retracted?	Yes <u>No</u>	Yes <u>No</u>
(b) Wing flap in take-off position (degrees)		
(c) Which is critical inoperative Engine? (throttle closed)	Left, Right	Left, Right
(1) RPM of inoperative engine? (RPM)		
(d) Are other engines operating at T.O. or maximum available power?	Yes <u>No</u>	Yes <u>No</u>
(1) RPM		
(2) Manifold pressure (in.Hg.)		
(e) Pressure altitude of test (Ft.)		
(f) Outside air temperature (°F)		
(g) What is the minimum control speed such that (MPH-IAS)		
(MPH-CAS)		
(1) Recovery of control to straight flight at this speed is effected without change of power?	Yes <u>No</u>	Yes <u>No</u>
(2) Bank does not exceed 5°?	Yes <u>No</u>	Yes <u>No</u>
(3) Rudder force (_____ lbs.) did not exceed 150 lbs.?	Yes <u>No</u>	Yes <u>No</u>
(4) No dangerous attitudes or uncontrollable tendencies encountered?	Yes <u>No</u>	Yes <u>No</u>
(5) No exceptional pilot skill strength or alertness required (of a private pilot) to prevent a change of heading in excess of 20° before recovery is complete?	Yes <u>No</u>	Yes <u>No</u>
(h) Does the minimum controllability speed exceed 1.2V _{s1} ?	No <u>Yes</u>	No <u>Yes</u>

3.106

3.111 (8) Transition Controllability

If the rudder force exceeds 20 lbs. for maintaining straight flight at V_{mc} in the configuration for item (7) above, answer the following:

Can straight flight control be maintained (by a private pilot) until the airplane has been placed in its "clean" configuration and attained its best R/C speed (single engine inoperative)?

Yes No

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

3. Multiengine Flight Characteristics With Critical Engine Inoperative:

a. Most Rearward C.G. Condition at Maximum T.O. Weight: (continued)

3.123 (9) Power On Stall - Critical Engine Inoperative

(a) Is landing gear retracted?	Yes No	Yes No
(b) Are wing flaps retracted?	Yes No	Yes No
(c) Which is critical inoperative engine? (throttle closed)	Left, Right	Left, Right
(1) RPM of inoperative engine?		
(d) Are other engines operating at 75% M.C. power?	Yes No	Yes No
(1) If "no", is power used that at which the use of maximum control travel just holds the wings laterally level in approaching the stall?	Yes No	Yes No
(2) What is RPM?		
(3) What is manifold pressure? (in.Hg.)		
(e) Pressure altitude of test (Ft.)		
(f) Outside air temperature (°F)		
(g) Trim speed at 1.5Vs1 (MPH-IAS)		
(h) Trim speed at 1.5Vs1 (MPH-CAS)		
(i) Maximum roll (degrees)		
(j) Maximum yaw (degrees)		
(k) Maximum pitch below level (degrees)		
* (l) Altitude lost (Ft.)		
(m) Maximum IAS during recovery (MPH)		
(n) Maximum CAS during recovery (MPH)		
(o) Maximum acceleration during recovery (G)		
(p) Was there any undue spinning tendency?	No Yes	No Yes
(q) Was recovery made without applying power to inoperative engine?	Yes No	Yes No
(r) Were operating engines throttled back during the recovery from the stall?	No Yes	No Yes

(s) Controllability	Good	Fair	Poor	Unsatisfactory
(1) Longitudinal:	_____	_____	_____	_____
(2) Lateral:	_____	_____	_____	_____
(3) Directional:	_____	_____	_____	_____

* Difference in altitude as measured on sensitive altimeter from moment airplane pitches to altitude at which horizontal flight is regained.

SECTION V. HANDLING QUALITIES:

E. Flight Characteristics:

3. Multiengine Flight Characteristics With Critical Engine Inoperative:

a. Most Rearward C.G. Condition at Maximum T.O. Weight: (continued)

(10) Directional Trim, Airplane With Four Or More Engines,
Two Critical Engines Out

(a) Is landing gear retracted?	Yes <u>No</u>
(b) Are wing flaps retracted?	Yes <u>No</u>
(c) Maximum weight (at which level flight speed range is 10 MPH or more)(lbs.)	
(d) Rearmost C.G. (Ref. Page <u>Appendix</u>) (% MAC)	
(e) Pressure altitude (Ft.)	
(f) Outside air temperature (°F)	
(g) Operating engines at M.C. power	
Manifold pressure (in.Hg.)	
Rev. per minute (RPM)	
Brake horsepower (BHP)	
(h) Which two engines are inoperative?	
(i) Are inoperative propellers feathered?	Yes <u>No</u>
(j) If "no", inoperative propellers are windmilling at RPM	
(k) Maximum level flight speed (MPH-IAS)	
(MPH-CAS)	
(l) Can airplane be trimmed at a speed 10 MPH (CAS) less than the maximum level flight CAS	Yes <u>No</u>
(m) If "no", what is rudder force necessary for straight flight? (Lbs.)	

REMARKS

ADDITIONAL SAWTOOTH DATA SHEET * _____

REFERENCE SECTION _____

1. General Information

- a. Landing gear position _____
- b. Flap position _____
- c. Which engine is inoperative? _____
- d. Power on operating engines (M.C.P. - T.O.) _____
- e. Weight _____ lbs.; C.G. _____ % MAC; Reference Page _____, Appendix _____
- f. Power on stall speed _____ MPH-IAS, _____ MPH-CAS
- g. Mixture setting _____
- h. Cowl flap setting _____
- i. Time of takeoff _____

2. Observed Flight Test Data

	Time	Pressure Altitude (Feet)		O.A.T. °F	C.A.T. °F	I.A.S. M.P.H.	Engine R.P.M.	M.P. In. Hg.	Dead Engine		Weight & Obs. R/C
		Ea. Min.	Ea. 1/2 Min.						R.P.M.	Pitch	
Climb # 1											
Climb # 2											
Climb # 3											
Climb # 4											
Climb # 5											
HS *											

* Record high speed run in level flight at intermediate altitude.